THIS WEEK'S National Petroleum NEWS

Coming Meetings

1933

Oil Equipment and Engineering Exposition, Convention Hall and Rice Hotel, Houston, Tex., May 22 to 28.

American Society of Mechanical Engineers, national industrial lubrication meeting, Nittany Lion Inn, State College, Pa., May 25, 26.

Fire and Safety Marshals, National Petroleum Association, Bradford, Pa., June, 2, 3.

American Oil Burner Association, Stevens Hotel, Chicago, June 12 to 16.

American Society for Testing Materials, Stevens Hotel, Chicago, June 26 to 30.

Pennsylvania Grade Crude Oil Association, State College, Pa., June 29, 30.

World Petroleum Congress, Imperial College of Science and Technology, South Kensington, London, England, July 19 to 25.

National Petroleum Association, Traymore Hotel, Atlantic City, N. J., Sept. 20, 21, 22.

International Gas Conference and annual meeting, American Gas Association, Stevens Hotel, Chicago, Sept. 25 to 30.

American Petroleum Institute, annual meeting, Chicago, Oct. 24, 25, 26.

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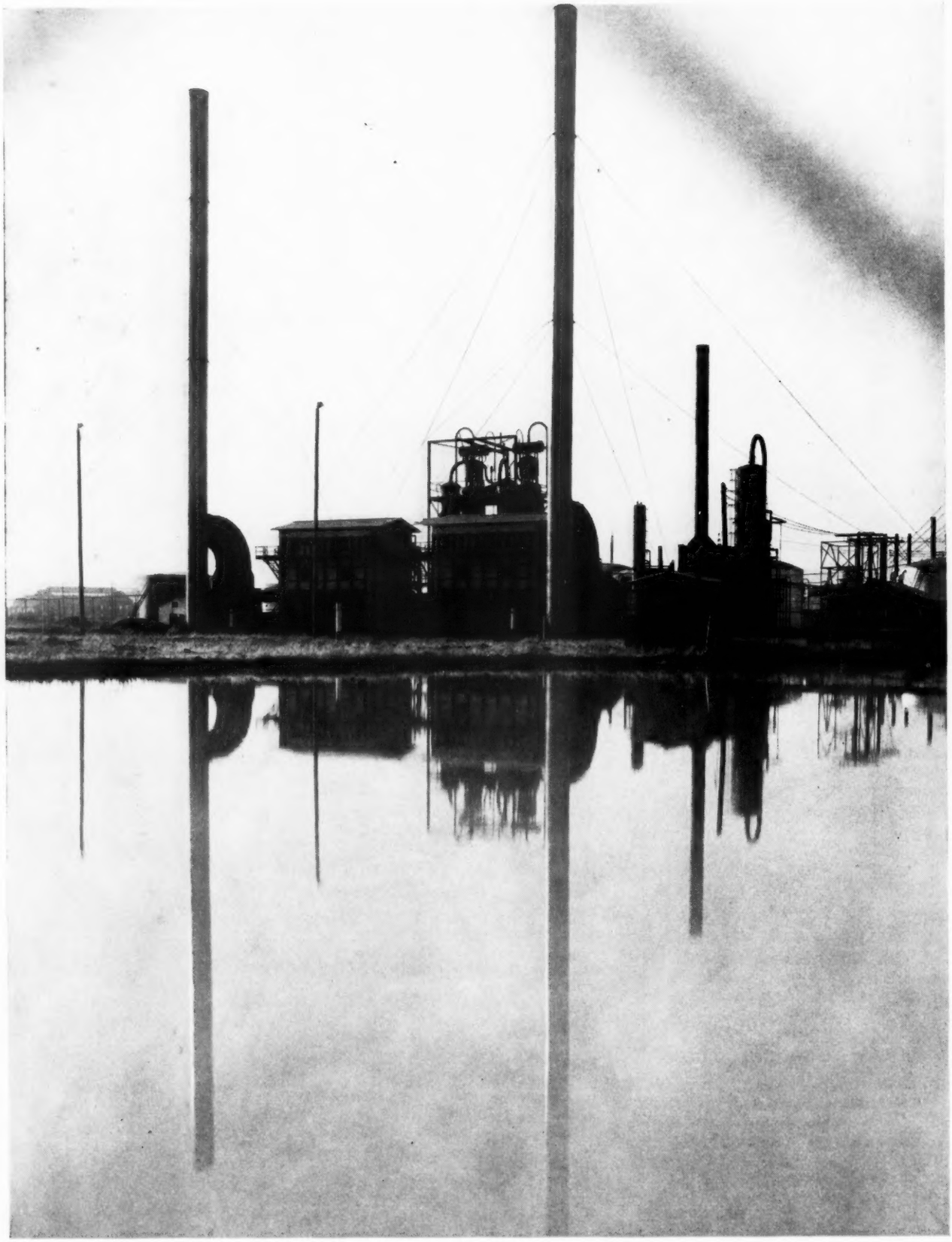

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East Texas on Pump by July if Present Rate of Production Continues

By Paul Wagner
N. P. N. Staff Writer

HOUSTON, May 13 — AN EFFECT of the present breakdown in production control of East Texas will be the creation of an immediate market for more than $50,000,000 worth of pumping equipment to recover the crude oil from its more than 10,000 wells.

The future rate of exploitation will govern the field's transition from the flowing to pumping well stage; but virtually all authorities are agreed that continued production at the 1,000,000 barrels daily rate, as at present, will put East Texas on the beam by July.

Lowered daily rates of production would stave off the pumping stage a few weeks, or months, longer. How much longer depends upon too many factors to make estimates more than broadly possible.

The one certain phase of the situation measured by petroleum analysts is that the drop in bottom hole pressures already recorded insures that 1933 is the last year that East Texas may be regarded as an economic menace. The industry will enter the high gasoline consuming season of 1934 with the field definitely out of the way as a flowing proposition.

An accelerated rate of pressure decline will be reached in the later stage of the field's flowing life, but even now it is estimated the loss is between three and seven pounds daily. Based on average bottom hole pressure of 1325 pounds attributed to the field May 7, the drop now would be to a level of about 1300 pounds.

Few technologists believe the field will flow after bottom hole pressures decline below 1050 pounds, and 1000 pounds may be considered conservative.

As an example of pressure drop acceleration, one company with large acreage and therefore somewhat protected property found that 13 days after reopening of East Texas 11 of its wells averaged 2.6 pounds daily decline. Three days later the average decline of its wells had reached 3.2 pounds daily.

In the areas of immoderate withdrawals of crude one instance was reported of a well showing pressure drops of nearly 14 pounds daily. Eight and ten-pound drops were frequent and field reports indicated an average decline of approximately 5.8 pounds on tests made.

When East Texas was regulated to 325,000 barrels daily the bottom hole pressure decline, by contrast, was five-tenths of a pound to the million barrels of oil recovered. Now the rate is 10 or 11 times that amount and increasing steadily.

Mishandling of the field by proration authorities, who have been largely responsible for the

Predicts Pumping by July

By Telegraph

HOUSTON, May 15.—Testifying before the Texas Railroad Commission at an East Texas proration hearing May 15, F. E. Heath, Sun Oil Co. engineer, predicted that the present rate of production would result in the field reaching the pumping stage some time in July.

When the field was temporarily shut down April 6, average bottom hole pressure in the field was 1334 pounds, Mr. Heath said. During the shut-down the average pressure rose to 1378 pounds. On May 8 the average pressure was 1313 pounds, an average decline of 5.31 pounds per day since April 25 when the field was reopened, he said Sun records showed. Records of some other companies show a somewhat smaller pressure loss.

present immoderate allowable of 750,000 barrels daily, has emphasized several damaging results in addition to the excess exploitation which now brings total production of the area to about 1,000,000 barrels daily.

The industry will be forced to expend immediately upwards of $50,000,000 for pumping equipment that otherwise it might not have found necessary for several years; the 114,000-acre field, which probably would have recovered 1,800,000,000 barrels final production now may be estimated to yield ultimately only about 1,140,000,000 barrels; the total flowing recovery probably will not exceed 400,000,000 barrels as compared with at least 800,000,000 barrels of the present reserve that should have been taken out under flowing methods.

Based on the foregoing calculations it is estimated that the proper handling of East Texas by agencies charged with the conservation of natural resources would have permitted crude oil prices to be maintained at an average of $1 a barrel and that there would have been averted:

Loss in decreased recovery	$660,000,000
Loss in market price of first 400,000,000 barrels produced, at least	200,000,000
Cost of pumping 400,000,000 barrels unnecessarily at 20c barrel above normal lifting expense	80,000,000
Total	$920,000,000

Cost of pumping equipment installation is not included in the foregoing installation, as it eventually would have to be charged to the recovery expense of the field anyhow. Could this expenditure have been deferred until a more propitious time, however, the industry would have been in better position to pay it.

The loss incident to the mishandling of East Texas is incalculable as applied to lowered returns to land and royalty owners, as well as operating companies; in the dissipation of reserves of operators whose main dependence for future reserves were in that territory, and who must begin next year and thereafter to protect their refinery needs by extensive replacement operations; the depressing effect of East Texas on oil districts elsewhere in the state and United States, and the billions of dollars toll thus resulting from the political tinkering of the past.

Although the field soon will be on the pump, if present withdrawal rates continue, it cannot, of course, be dismissed as a source of crude supply. The 10,026 wells now drilled in the field will easily pump an average of 100 barrels daily for a long time. This would equal the present rate of withdrawal. But it will require a much higher price than 25 cents to get the oil out.

On the pump the advantage of the persistent proration violator will be lost as will that of the skimming plant buyer of "hot" oil who has been disrupting the refined oil market because of his cheap crude. Responsible producers then will get the "breaks" because their pumping cost on fair sized tracts will be far less than those of the one, two or three-well tracts.

Another important fact is that enforcement of proration in a pumping field is much simpler. There is visible evidence when a well is pumping.

Exact figures on current East Texas production are not obtainable. Reports on oil moved from the field continue to indicate a production well over 1,000,000 barrels daily. Fewer operators now are holding their oil off the market since the price has been standardized at 25 cents per barrel. Humble Oil & Refining Co. now has posted 25 cents after having no fixed posting for several days.

Humble Pays Million for Half Of Wildcat Block in Texas

HOUSTON, May 13

PURCHASE by the Humble Oil & Refining Co. of a half interest in a 10,000-acre block of the Magnolia Petroleum Co., at Tomball, northern Harris county, for a consideration of $1,000,000, is confirmed. The Humble probably will operate the property on which two structurally "high" wildcat test wells are at the point of completion.

The Tomball area is so certainly established in the minds of the industry as a new oil field of the Conroe type that the Humble a week ago bought a seventeen-sixty fourths operating interest in the leaseholds of the Standard Oil Co. of Kansas, amounting to several thousand acres. Humble already owned full leasehold rights to several thousand acres additional.

Structural data disclosed by the drilling of the Magnolia's two test wells on the old Vacuum Oil Co. geophysical block at Tomball has indicated an oil field of 10,000 acres or more of the Conroe type. Production is expected at approximately 5500 feet as compared with 5200 feet at Conroe, the Tomball area being down the Coastal plains dip.

The Magnolia No. 1 Martens test in the Joseph House survey had resumed drilling after a week's shutdown and was last reported coring ahead at 5297 feet, between 748 and 790 feet below the top of the Hockley-ensis marker formation, depending on whose paleontological determination is considered the most accurate. The No. 1 Kobs test, two miles south of the Martens, was rotating with hole bottomed at 5090 feet.

At Conroe, 20 miles northeast of Tomball, the daily production of Montgomery county had climbed to 74,000 barrels over the week-end. The more than 350-well wells in the main Conroe pay at approximately 5200 feet were prorated at 60,000 barrels daily by the railroad commission. Production from 20 wells at upper levels, which the commission has made no effort to prorate, had reached to 14,288 barrels daily May 11.

THE EDITORS' VIEWPOINT

How About a Penny a Barrel

By Warren C. Platt, Editor

THE oil industry has paid a big price for its education on proration. And the education, sad to relate, is not yet completed. For this phrase we are indebted to W. T. Holliday, president of the Standard Oil Co. of Ohio, one of the chief sufferers from two and more levels of crude prices, because he has to buy all his crude oil at the posted price and sell its products against products from cheap and bootleg crude.

Proration is a fine thing and it, or unit operation, have worked well in some fields where the operating companies were honest with each other. But when it gets into the rough and tumble fighting of politics and politicians proration seems to be something entirely different.

Fine spun theories must be gauged on their contact with hungry political workers. When Henry L. Doherty first brought up his unit operation he cushioned his remarks with the statement that the most honest part of our government is the federal portion of it and that, as a practical matter, the sooner we put proration there the better and cheaper.

But a lot of lawyers got the thing all gummed up with constitutionality and Mr. Doherty was coaxed out on that limb instead of staying on the one on which he was perched, towit that regardless of constitutionality you get more honest politicians at Washington than you do in state capitols.

Of course Mr. Doherty could not and did not say just exactly that, but we take it that was what he meant and we agree with him.

A lot of fine constitutional lawyers drove the industry back to the states and here we are with proration, orders and the state's military establishments, and proration is a joke. It was common talk over at Oklahoma City that for 10 cents a barrel you could produce all the oil you wanted. The rate in East Texas must be a great deal less.

We are not unsold on proration or the idea that the states can enforce it but some times we wonder if our grand children will ever profit by it, or even their children. A certain law against strong drink didn't seem to dry up the country although it had much moral and physical reason behind it.

East Texas, as an oil field, is one of the great crimes against civilization. Down in East Texas they don't look at it in just that way. To them, in a poverty stricken country, the oil boom, is much to be desired. They want enough money today to pay off the mortgage, send daughter and son to the university, buy a new car and put aside a few dollars against old age.

You can't blame them, when you see the country, for that point of view, but today East Texas under "proration" is wrecking the oil industry. And this oil industry has long since ceased to consist of John D. Rockefeller. There are a million and more people of all walks of life holding its stocks and they are being impoverished by the East Texas field.

East Texas, the biggest good oil field in the history of the world, has just run hog wild. It got all tangled up with politics and politicians. Proration became a joke. Production was permitted there sufficient to wipe out a lot of other fields. Its gasoline came into many markets and wrecked them. Crude oil that did not pay the state tax and gasoline that evaded all taxes, wrecked most of the markets of this country.

Proration under state management has so far failed dismally. Whether it ever can amount to anything under state management is a question. Certainly Texas and Oklahoma cannot by their history recommend state control of proration.

NOW we have a posted crude price of 25 cents a barrel in East Texas. You cannot produce good spring water for that.

Today fuel oil in tank cars is selling at a penny a barrel or $2 for a whole tank car of it, down in East Texas and some say you can get it for nothing if you provide the tank cars and take it away. Railroad sidings at the Gulf are filled with tank cars of fuel oil and crude accumulating demurrage and freight charges until the railroad cannot even sell it for a fraction of their charges.

The railoads in that territory have been equally hog wild and have moved crude that they must have known was produced illegally and these roads today are paying a penalty in that companies are finding other ways of moving their oil.

So we get down to the heading of this editorial, "A Penny a Barrel for East Texas Crude." It will raise havoc with the southwest, the banks and the people down there but if the residents of Texas will not honestly enforce proration then perhaps the best thing is for the oil industry to follow the market down even to a penny a barrel.

Some time or other when some of the residents and operators in East Texas must pay for a hamburger sandwich with five barrels of oil, that may bring them to their senses.

Holmes to Continue Activities In Behalf of Conservation

NEW YORK, May 13

R. C. HOLMES will continue his activities in behalf of conservation and stabilization in the oil industry although he no longer is an officer of The Texas Corp. and its operating subsidiary, The Texas Co. He remains a director.

Mr. Holmes is now on a short vacation but will return to New York shortly and will probably have an office in the Chrysler building where The Texas Corp. has its headquarters also.

In a statement to the press this week Mr. Holmes revealed a difference of opinions about policy had existed in The Texas Corp. This was shown in his letter of resignation as chairman of the board on May 5, about 10 days after he had been elected to that position after seven years' service as president of the company. He indicated in his statement that he would carry his fight as to policy to the corporation's stockholders.

Since the 1933 annual election of directors of The Texas Corp. was held last month, it is believed in New York that little can be done toward attempting to replace the present regime of the company before the next annual meeting except to line up stockholders who may have been in accord with the Holmes policies.

These policies, Mr. Holmes stated, dealt with petroleum conservation, gasoline tax evasion and a general rationalization of the oil industry. His activities in behalf of these subjects are well known in the industry. In his letter of resignation he said:

"It is very evident that this board differs with me decidedly in respect to the policies to be followed in carrying out necessary activities which I have thought, and still think, to be so vital to the best interest of the company, of the oil industry, and our nation. Until April 24, the day before our stockholders meeting, I conceived the policies which I have been following to be the policies of the company. Until then I did not know that these policies were considered by the board to be solely my policies, and that they were not in accord with the wishes of the board.

"To permit you to tie my hands and to still my voice at a time such as this, when it is so apparent to anyone with understanding and who has the power, even in a slight degree, to assist in overcoming the factors that are so destructive to industry and to the welfare and existence of great numbers of people throughout the world, is unthinkable.

"Our differences of opinion with respect to these policies have become so irreconcilable that I, of necessity, hereby tender my resignation as chairman of this board, to take effect immediately."

G. G. Allen and W. A. Fisher, two of the directors of The Texas Corp., were not present at the meetings of the board at which Mr. Holmes was elected chairman April 25 and W. S. S. Rodgers was elected to succeed him as president, and at which Mr. Holmes resigned as chairman May 5. Mr. Allen, it is understood, is a large stockholder and also representative of the Duke (tobacco) estate. Mr. Fisher is one of the Detroit family heavily interested in General Motors.

It is understood the largest stock holding in the company is that of the John W. Gates estate which is not represented on the board. Important stockholders are H. G. Lapham, Boston, and J. H. Lapham, San Antonio. The latter was elected chairman of the executive committee at the April 25 meeting. He succeeded T. J. Donoghue, Houston.

Mr. Holmes had been active with The Texas organization since the company was formed in 1902. He joined the organization as manager of the refining department. With Fred T. Manley, at present a vice-president, he invented the Holmes-Manley cracking process.

He became a director in 1906, a vice-president and chairman of the manufacturing and marketing committee in 1913, a member of the executive committee in 1930, and president in 1926.

Besides his connection with The Texas Corp. as director and large stockholder, Mr. Holmes is a director of Chase National bank, New York, the Freeport-Texas Co. and the Sulphur Export Corp.

Sinclair Asks for More Oklahoma City Crude

TULSA, May 13.—Sinclair Prairie Oil Marketing Co. has nominated 60,000 barrels daily for May as the amount of crude it is willing to buy from the Oklahoma City field. This is in addition to the 9500 barrels daily nominated late in April. The corporation commission assigned the request for increased allowable for hearing on May 16.

Other large increases in nominations to buy Oklahoma City crude were reported to be probable if the Sinclair Prairie bid is allowed. The offer to take the additional 60,000 barrels daily is generally construed as evidence of this company's belief that the day of bargains is here and that it is worth while to store considerable oil.

Oklahoma City is not at this time yielding the amount of crude allowed for May, as some operators are refusing to sell at the 25-cent price. Daily allowable is 159,000 barrels and pipeline movements are around 25,000 barrels under this figure.

In the McPherson district of Kansas 47 wells have been shut in. The combined production of this group in April averaged 5400 barrels daily. Under an order issued this week by the corporation commission of Kansas, production withheld because of the low price may be taken in the future.

Benzol Makes Possible 'Alky-Gas'

Cities Service Sells Abroad

NEW YORK, May 16

REPRODUCTIONS of circulars advertising an alcohol gasoline blend sold in England by Cities Service Oil Co., Ltd., which are being circulated through the middle west, tell only part of the story. The blend being marketed by the British subsidiary of Cities Service Co. is a blend of gasoline of export grade, benzol and anhydrous alcohol. The benzol and alcohol are British products and fit in with the "Buy British" campaign being carried on through the British empire.

Cities Service introduced an alcohol blend in England late last year. It did not work because the alcohol and gasoline is understood to have separated too much to be a satisfactory motor fuel. Benzol was then introduced in the blending and the resultant fuel has had acceptance.

Cities Service, it is stated on good authority, is using 16 per cent anhydrous alcohol, 9 per cent benzol and 75 per cent gasoline. The blend is practical in England but, according to technologists connected with and not connected with Cities Service, it is impractical now in the United States.

There is no appreciable difference between the prices of alcohol and gasoline in England because gasoline is much higher priced in England than in the United States. Alcohol is many times higher than gasoline in the United States. The retail price of gasoline in England is 1 shilling 7½ pence per imperial gallon. This is approximately 26 cents per U. S. gallon. The blend being sold in England commands 2 pence premium, or between 2 and 3 cents premium per U. S. gallon.

A high percentage of benzol is used in Cities Service motor fuel in England. Production of benzol in the United States is relatively less than in England. It would be impossible, technologists say, to get ample benzol supply to use anywhere near as large a percentage of benzol in the United States as in England to meet the American demand for motor fuel.

Technologists are universal in their statement that the larger the percentage of anhydrous alcohol used in blending with gasoline the more stable is the product. Benzol is a great aid in maintaining stability. This has been the experience of Cities Service in England and one of the principal reasons why it continues to offer a fuel containing alcohol that fits in with the "Buy British" campaign.

The benzol is a British product. The anhydrous alcohol is made in the British Isles from molasses made from cane grown on British plantations in the British West Indies.

Cities Service sets up these claims for the blend in the folder reproductions of which are being circulated in the middle west:

"1. The entire absence of 'pinking' or 'knocking.'

"2. Greater flexibility and greater power output which means a much better top-gear performance, particularly noticeable in hill-climbing.

"3. Assurance of higher maximum speed and also greatly improved acceleration, because it permits a more advanced ignition timing to be used.

"4. An increase in miles per gallon because of the better performance that will be obtained in top gear.

"5. Assurance of a cleaner and cooler engine. This advantage is particularly noticeable in air-cooled motor cycle engines."

Just how much of the improved performance was due to the alcohol and how much to the benzol, would be difficult to state without extensive scientific experiments.

The English, because of the high tax rates, use higher compression, higher speed engines than Americans use. This is because of the high tax rates based on rated horsepower which is gauged solely on the size of bore and number of cylinders.

The sale of premium motor fuels has been increasing in England because of the swing to engines with high compression ratios in order to get greater actual power at a minimum rated horsepower. In the United States the sale of premium fuel has been decreasing since about midyear 1931. The decrease is believed to be due largely to the depression.

It is feared by many in the oil industry that forcing alcohol on the oil industry with its higher price, estimated at 2.6 cents a gallon by the Department of Agriculture for a 10 per cent blend, would further reduce motor fuel demand in the United States. This is all aside from the actual loss of a large part of the market for gasoline that would be caused by the replacement of gasoline with the alcohol.

The proponents of the blend have taken Cities Service folders and placed on them stickers reading, "The American

Thish is Shad News!

By Telegraph

PEKIN, Ill., May 15

THE Save-the-Farmer-with-Alcohol campaign which has raged the last few months through the corn belt, was a wee bit groggy today because it became known the movement to save the American farmer, particularly the middle western grain grower, was being suckled on alcohol made from molasses from Cuba and Louisiana.

The anhydrous alcohol being used for Illinois and Iowa consumption in motor fuel has not come from the Pekin plant of the American Commercial Alcohol Corp. Jacob Younge, manager of that plant, let it be known for the sake of veracity. It has come from Philadelphia.

The Pekin plant has 600,000 gallons of commercial grain alcohol on hand but it is unwilling to spend $50,000 to $75,000 for equipment required to make anhydrous alcohol until it is definitely known whether the oil industry can be forced to be a Santa Claus to the farmer-alcohol group.

Mr. Younge made his statement in a Pekin newspaper to correct false claims that the alcohol being used in experiments hereabouts was a local product.

Public Wants to Know Why Grain Alcohol Blend Gasoline should not be used to save American farming, the foundation of American business, if it is good enough business of one of America's largest oil companies against 'Buy British' propaganda?"

The reasons, as given at Cities Service headquarters were that conditions are entirely different in Europe from conditions in the United States. These differences were stated earlier in this article but the reason why alcohol blends are opposed so strongly by both the petroleum and automotive industries at this time may be summed up in one clause, "Because alcohol blends are uneconomical."

Dr. Gustav Egloff, research chemist of the Universal Oil Products Co., speaking at a gathering at the Chemists' Club in New York, May 11, said the petroleum industry could produce more alcohol a year from the uncondensed gases that are being burned under stills than the farm industry could produce with the entire annual corn crop.

'Alky-Gas' Is Live Issue In Iowa, New Bill Comes Up in August

DES MOINES, May 13 ALCOHOL-GASOLINE is a live issue in Iowa, and the ghost of the legislation laid at rest last winter will rise in the special session of the legislature in August with several interests ready to breathe life into the issue.

This is a corn producing state, the largest in the country. Prices have been low. Various interests who would profit from compulsory blending of alcohol with gasoline have not been slow to take advantage of conditions.

Since the proposed 10 per cent alcohol-gasoline blend was voted down in the legislature last winter several organizations have been keeping the issue alive. Chief among those working for "farm relief" through alky-gas are the Chamber of Commerce at Spencer, Iowa, and numerous Junior Chambers of Commerce throughout the state. In fact the Junior Chamber of Commerce state convention in Waterloo May 13 was to give alky-gas a prominent place on the program.

Farmers generally, and several farm organizations, have indicated no disposition to be interested in alcohol-gasoline.

Propaganda is being spread now by holding "demonstrations" in various cities. These are sponsored by local commercial organizations. The blended motor fuel is obtained by motorists at regular service stations, or those back of the plan obtain a quantity of gasoline, put in the alcohol, and do the selling to the public. "Demonstration" day is widely advertised to bring people to the cities.

"Demonstrations" are held of course to focus attention on the possibilities of the plan as a "farm relief measure" and to get farmers and city motorists to use the blend in their automobiles. That is the stated purpose.

It has been suggested that other motives may be beneath the surface, and that proponents of the plan are using local commercial organizations as a tool for propaganda purposes. Local commercial organizations would gain from such "demonstrations" by attracting crowds to town, and thus increase sales in the stores.

In Ames, Iowa, one of the "demonstration" points, the sale of alky-gas was started several weeks ago, and can be purchased now at three local service stations. One of the stations has a sign in front announcing "corn alcohol," and it is purchased from a commercial alcohol plant in Illinois.

This station passes out cards to alky-gas customers to obtain opinions on performance of the blend. The business reply card is to be returned to the Junior Chamber of Commerce at Ames. Customers are asked to test the blend (10 per cent alcohol) and to report on whether they obtained better acceleration, smoother engine performance, higher speed, decreased knocking, greater mileage, easier starting, and to look in the sediment trap on the gasoline line for separation of water. All questions are pointed.

The station also distributes a six-page folder to customers explaining the alcohol-gasoline "farm relief" plan. This is issued, and carries the name, of an Illinois steel company. The company's brand name of fencing is on the first and last pages.

Corn is proposed as the source of alcohol for blending with gasoline yet if all gasoline sold in Iowa contained 10 per cent alcohol only 14,000,000 bushels, or about 1 per cent, of the crop would be needed. This 14,000,000 bushels would not be entirely needed for alcohol. About half of it would return to the market as distillers' feed, a prominent factor in farm markets in pre-prohibition days, so in reality only about ½ per cent of the state's total corn crop would go into alcohol.

What effect the absorption of about ½ per cent of Iowa's corn crop in motor fuel would have on corn markets generally is considered questionable. Surplus corn in Iowa and other states still would be a market factor, and alcohol can be manufactured from the poorer grades of corn.

Other considerations that have not been explained by proponents of the plan are about the cost of building distilleries throughout the state; the increased incentive, through higher taxation on non-alcoholic motor fuel, to evade the state gasoline tax; and the potential loss of gasoline tax revenue to the state through additional evasion.

Independents Boost Crude

WICHITA FALLS — Two north Texas refiners have posted higher prices for crude in the district than the general 25-cent level prevailing. Olney Oil & Refining Co. is paying 37½ cents at the well and Panhandle Refining Co. 30 cents.

Commercial Discounts Eliminated In New Socony Structure

CLEVELAND, May 16 WHOLESALE and retail price structure for gasoline is being based by Standard Oil Co. of New York on the Gulf tanker market for gasoline beginning May 15 in New York State, except metropolitan New York and Buffalo, and the New England states, and May 22 in metropolitan New York. Buffalo will still be based on the Oil City market.

Commercial discounts at service stations except where contracts exist are being discontinued, and a 2-cent cash discount is being offered all classes of customers at service stations. Under this arrangement the cash customer will pay the same price as the commercial contract customer. The individual charge account customer will pay the posted service station price or 2 cents a gallon more than the cash customer pays.

The structure is being followed in the territory by most major marketers with the exception to date of Gulf Refining Co. Gulf is studying the structure and is expected to decide what it will do in a day or two.

The basic price at present is 3.75 cents a gallon for 68 octane gasoline at the Gulf. To this price is added tankerage, terminal charges, and other handling expenses and freight charges to inland points. The company has set up basic prices at its various marketing points which will fluctuate with the Gulf market but only when the Gulf market moves 0.25 cent a gallon one way or another. Smaller fluctuations will be ignored.

Dealers will pay the basic prices. The new basic prices are 3 cents off the normal cash station price, 5 cents off the posted service station price. If competition cuts the service station cash price, it is the plan to meet the competitive price but not to change the basic price. Basic prices with 3.75-cent gasoline at the Gulf are:

New York 7.2 cents
Albany 7.3 cents
Buffalo 8.2 cents
Rochester 8.4 cents
Syracuse 8.0 cents
Boston 7.2 cents
Augusta, Me. 7.7 cents
Manchester, N. H. 8.4 cents
Burlington, Vt. 9.0 cents
New Haven, Conn. 7.4 cents
Providence, R. I. 7.2 cents

All these prices are before the addition of federal and state taxes.

These basic prices are 4 cents under the posted tank wagon price except at Burlington, Vt.

The posted service station prices are 1 cent a gallon above the posted tank wagon prices, making the differential between the basic prices and the posted service station prices 5 cents a gallon. With the 2-cent cash discount and 2-cent commercial discount dealers would have left 3 cents a gallon margin.

Commercial discounts are eliminated in the new structure so far as non-contract buyers are concerned. Most contracts have until the end of this year to run. The structure is expected to convert charge account buyers into cash buyers and thus eliminate bookkeeping expense and credit losses.

Will Try Collecting Back Natural and Benzol Tax

WASHINGTON, May 15—Indications are that the government will try to collect the 1-cent federal gasoline tax on all natural gasoline and commercial benzol sold by manufacturers between June 21, and Aug. 6, 1932 and all sales after April 28, 1933.

This is the result of the recent decision of the Collector of Internal Revenue reversing his former ruling last August. At that time he ruled the two products as such were not taxable but now he says that the former ruling was in violation of grammatical and legal construction rules.

Wirt Franklin Receiver Named

By Telegraph

TULSA, May 16 — W. N. Stokes, attorney, was named receiver May 15 for Wirt Franklin Petroleum Corp., Cromwell Franklin Oil Co., and the personal oil interests of Wirt Franklin. Appointment was made by state district court on application of J. I. Cromwell and other major stockholders.

The stockholders alleged that creditors of the companies have assumed control on boards of directors although owning little stock. An order was asked to prevent Tulsa and Oklahoma City banks from selling stocks and bonds held as collateral for debts of the companies.

I. C. C. Allows Railroads To Cut Coal Rates

WASHINGTON, May 15.—The Interstate Commerce Commission has given mid-western railroads permission to cut coal rates to meet natural gas competition. The carriers are not obliged to give adjacent points the same cuts or to observe the long and short haul clause of the law.

Under the permit, as soon as a gas pipeline reaches a new community the railway may cut its rates without making a special request at that time. Gas companies opposed the rule, arguing that the rule itself would prevent extending gas lines.

East Texas Proration Case Up May 25

FORT WORTH—Judge Randolph Bryant, of the U. S. District court, before whom suit for injunction against the Railroad Commission of Texas was filed by H. L. Hunt, has ordered the case to be heard May 25 in Fort Worth by a three-judge federal court. Hunt, one of the large operators in East Texas and consistent supporter of proration, seeks to have the commission restrained from writing further orders on East Texas on the same basis as the present one.

Roosevelt Declines to Sponsor Oil Control Bill in Congress

By A. E. Heiss
N. P. N. Washington Bureau

WASHINGTON, May 15—LEADERSHIP of any fight made in Congress for a petroleum dictatorship is not likely to be assumed by President Roosevelt. That fact was disclosed May 12. The President then allowed it to become known he did not plan at that time to send a message to Congress on the subject. The most he will do will be to send a letter to the appropriate committees setting forth conditions in the industry which, to the leaders in Congress, may suggest the desirability of a control of the industry apart from a control of all industry.

If President Roosevelt adheres to his idea that he will not ask, by means of a message, for the enactment of dictatorship legislation, the way will be left open for leaders in the petroleum industry to take up the subject and work out a solution by conferences among themselves and with members of Congress.

A dictatorship bill growing out of suggestions made by two groups in the petroleum industry may reach Congress this week, not, however, bearing the stamp of White House approval. The President has been able to give but little attention to the preparation of the bill.

The inference from the fact that he will not send a message to the capitol is that he is unwilling to take the responsibility for the measure as he did in the matter of the railroad dictatorship bill now on hearing in the committees of the two houses and attracting opposition from supporters of the President.

Of the various dictatorship bills proposed, the one drawn by the governors' committee is likely to be most heavily favored, if any bill is actually considered by Congress at this session. This bill is the result of a suggestion of the Independent Petroleum Association of America headed by Wirt Franklin and Russell B. Brown, who have an intimate knowledge of how things are done at Washington by reason of their 3-year fight for oil import taxes.

The possibility that no bill will be considered this session is not to be overlooked. The President wants Congress to quit in June.

The whole subject is about as mysterious as the origin of the suggestion for the holding of the conference of governors. That conference, like Topsy, "just growed." No one would say that it originated at the White House nor would any one admit that it was the result of thoughts by Secretary of the Interior Ickes.

The Senate is not yet ready to accept the Marland "hot oil" bill, which, notwithstanding contrary expectations, is still sticking in the House committee on interstate and foreign commerce to which it was sent nearly a month ago. Senator Gore of Oklahoma offered the Marland bill as an amendment to the revenue bill passed by the senate on May 12, already passed by the House. However, it was rejected upon a voice vote without any effort being made to have a record roll call on it.

Senator McAdoo of California, probably speaking for the Californians who were insurgent in the governors' conference early in April, denied a statement made by Senator Gore, upon authority of Russell B. Brown, to the effect that passage of the "hot oil" bill was the only point upon which there was unanimity in the oil industry.

"I may say that there is a wide difference of opinion among those interested in the oil industry in California about this measure," said the junior senator from California.

"I hope sincerely that the senator (Gore) will not press this amendment because I think it ought to go to a committee and be thoroughly considered. I wanted to say that much in view of the thought expressed by the senator from Oklahoma that all of the oil people are willing to accept the amendment. They are not, so far as a large part of the California industry is concerned."

Senator Gore added that he had talked with Representative Marland the day before (May 11) and that Mr. Marland also said that this was one thing upon which all oil people agreed. He added that some wanted to go farther than the Marland bill went, adding that there was a group which wanted and were insisting upon a dictatorship.

"That is probably what will come in place of what I propose," added Senator Gore.

The revenue bill which carries an amendment to the present law extending the one-cent gasoline tax for a year from next month was passed without a roll call. It also carries amendments smoothing out rough places in the administration of the gasoline tax so as to avoid discrimination against sellers who are not also producers.

Fire Marshals to Meet At Bradford, Pa.

CLEVELAND, May 16—Fire and Safety Marshals of the National Petroleum Association will hold their annual meeting at Bradford, Pa., June 2 and 3.

Features of the program will include practical fire fighting demonstrations and a first aid contest among teams in Pennsylvania and adjacent refineries. James H. Herbert of the Standard Oil Co. of Ohio, is president of the fire marshals.

Alcorn with Wirt Franklin

OKLAHOMA CITY—John S. Alcorn has been elected comptroller of the Wirt Franklin Petroleum Corp. He was for several years a vice-president of the Marland Oil Co. in charge of the land and leasing department.

A. P. I. Board Split on Need For Oil Industry Control

By Roger B. Stafford
N. P. N. Staff Writer

NEW YORK, May 12

TWENTY-EIGHT members of the board of 75 directors of the American Petroleum Institute met at A.P.I. headquarters May 11, heard a brief outline about the general industries control proposal which is to have the support of President Roosevelt, discussed a draft of another oil industry dictatorship bill, and then adjourned after an hour because, it was announced, so few members wished to bind the industry to any program. The next meeting of the board was set for May 17 in Tulsa.

It is known that the A.P.I. board is split on the question of industrial control. Even directors representing the same company differ in their opinions of control. A majority of those who attended the two A.P.I. meetings in New York this week were opposed to governmental control even during an emergency period of two years as provided in various drafts of proposed bills.

There is a widespread fear that should the industry assent to emergency dictatorship by a governmental agent or bureau that the industry would never be able to free itself after the emergency has passed; that the price fixing provision of most of the drafts that have come to light in the last two weeks, would place the industry in a public utilities cast from which it never would escape.

Numerous directors prefer to "let nature take its course" and hope that present chaos may end although they may have no idea as to what the ending may be. Reports of continued high production in East Texas and rapid decline in well pressures, are perused and the belief is held by a few directors that the East Texas question is about to solve itself unless further tinkering with proration allowables is attempted.

The cost of this remedy in East Texas—pumping equipment is estimated at $50,000,000—is admitted to be high but there are high ranking oil men who believe the price will be well worth while if the position of the other producing fields is strengthened by the decline in East Texas production.

The general industries control bill was not completed when an A.P.I. committee headed by W. T. Holliday, Standard Oil Co. of Ohio, called on its proponents in Washington May 10. There were not many definite points that could be told about the proposed bill at present, Mr. Holliday is understood to have told the board members May 11.

The oil industry dictatorship bill considered only a brief time at the May 11 meeting, carries most of the provisions incorporated in other dictatorship proposals except that specific limitation of petroleum imports was omitted, a provision for which the Independent Petroleum Association has been working.

Under this latest proposal, one believed to have been considered in high government circles, interstate shipment of illegally produced crude oil or products made of it would be prohibited as in the Marland bill. The Secretary of the Interior would be empowered to pry into the industry's operations in order that he or an agent may ascertain whether there is overproduction.

In case of overproduction including excessive withdrawals of oil from storage and imports, the secretary would designate just where such overproduction existed. He then could require a permit be obtained from him to move any crude oil or its products from such point or state in interstate commerce. In no case would permits be issued that would permit movement of oil in excess of reasonable market demand at fair prices.

If excessive supply is determined to be caused by imports the secretary would be empowered to restrict imports by setting quotas for imports and sources.

The secretary would be empowered to set prices in an emergency. Minimum and maximum prices might be set on oil moved in both interstate and intrastate commerce.

New York Producers Build Refinery

BOLIVAR, N. Y., May 15—Allegany Refiners, Inc., has signed a contract with Leader Industries, Inc., Decatur, Ill., for the construction of 750-barrel refinery at Bolivar, N. Y. The plant is to process Pennsylvania grade crude produced by a group of operators in the Allegany district, who are stockholders in the new corporation. A. L. Shaner is president of the company.

The refinery was laid out and its units planned by the technical staff of Leader Industries under the direction of Dr. E. H. Leslie, professor of chemical engineering, University of Michigan. All construction work also will be done by Leader.

Work already is under way on the 25-acre site which will allow room for expansion later to a capacity of 4000 barrels daily. The present building plan involves the building of one shell still unit, two pipe still units, boiler house with two 250-h.p. boilers, turbo generator set for electric power, filter house, burner house, wax and centrifuge plant, sweating house, agitator, barrel and stock house, about 80 tanks and other auxiliary buildings and equipment.

Leader Industries recently completed building a distillation unit for Bradford Oil Refining Co. which is said to be producing oil of remarkable characteristics. A feature of the plant is the use of steam under closely controlled conditions instead of vacuum. This unit also was built under the direction of Dr. Leslie.

"Q" Gasoline Rights May Be Given Jobbers Not Selling Ethyl

NEW YORK, May 13

JOBBERS may be licensed to handle gasoline treated with "Q" compound although they may not be Ethyl licensees of the Ethyl Gasoline Corp. at present, became known here this week. This plan is expected to spread the sale of lead treated gasoline far more widely than the sale of Ethyl gasoline the last several years.

Gasoline treated with "Q" compound will be available in all parts of the United States east of the Rocky mountains May 27. The gasoline will not be advertised as containing lead tetra-ethyl and it will not be red, a color that is used exclusively in Ethyl gasoline.

The "Q" compound is being shipped in "minimum yellow" color so that refiners and others licensed to blend it with gasoline may use any color they desire. Color is required under the U. S. Public Health regulations which also apply to Ethyl gasoline. By adding red dye and blending with a gasoline that meets the Ethyl Gasoline Corp. standards the compound may be used for Ethyl gasoline.

Standard Oil Co. of New Jersey and controlled companies will offer the "Q" treated motor fuel as Essoline, a companion to its Esso motor fuel which is Ethyl. In this group of companies are Colonial Beacon Oil Co., Standard Oil Co. of Louisiana and Humble Oil & Refining Co.

Socony-Vacuum Corp. will treat its intermediate grade with the lead compound. In this group are Standard Oil Co. of New York, Vacuum Oil Co., Inc., Magnolia Petroleum Co., White Star Oil & Refining Co., Wadhams Oil Co., Lubrite Refining Co., White Eagle Oil Corp., and several smaller companies which Vacuum has acquired the last few years. General Petroleum Corp., operating on the Pacific Coast, will not use the compound at present.

Among other treaters known to date will be: Richfield Oil Corp. of New York, Standard Oil Co. of Ohio, Continental Oil Co., Tide Water Oil Co., Skelly Oil Co., Barnsdall Corp., Phillips Petroleum Co., Marathon Oil Co., and most of the larger Independent refiners of western Pennsylvania. At Ethyl Gasoline Corp.'s offices it was said a list of "Q" licensees would not be issued.

It was said the company was not stimulating an octane race and to prevent such it had put a maximum octane limit of 70, A. S. T. M. method, on the blended fuel. However, it was said, if licensees find they have to compete with other motor fuels of higher than 70 octane that permits would be issued to meet such competition.

It was said the idea of the new "Q" plan was to give refiners flexibility in making anti-knock motor fuels without forcing them to make heavy capital expenditures. It was pointed out that many "Q" licensees would be able to blend "Q" fuels with equipment already in use in blending Ethyl gasoline.

The "Q" plan permits the use of only 1.5 cubic centimeters of lead compound per gallon of motor fuel. In Ethyl gasoline 3 c.c. may be used with an octane rating of 76 under the new method of octane determination.

In broadening the use of lead compound it was said Ethyl Gasoline Corp. had not lost faith in the premium fuel market. Belief was expressed that as soon as business picks up and economic conditions are normal that motorists will return to the premium market because of the better performance they can get from their cars with the higher anti-knock gasolines.

With a relatively high anti-knock gasoline available throughout the country—California gasoline in the far west and "Q" and other anti-knock gasoline from the Rockies east—automobile manufactures are expected to step up their compression ratios. Some makes of cars are considerably higher this year than last. Ford has a 6.5 to 1 ratio in the aluminum headed V8. Heads providing such a ratio and even higher are available as optional equipment in several lines.

* * *

TULSA, May 13.—The Great Lakes pipeline group of companies in the Mid-Continent decided this week to use "Q" compound in regular grades of gasoline. In this group of companies are Barnsdall Refineries, Inc., Mid-Continent Petroleum Corp., Pure Oil Co., Continent Oil Co., Skelly Oil Co. and Phillips Petroleum Co.

S. O. New Jersey Changes Retirement Age to 60

NEW YORK, May 15.—The pension plan of the Standard Oil Co. of New Jersey and subsidiaries has been altered to retire employes at the age of 60 rather than 65, effective July 1. The company finds itself overstaffed in spite of the five-day week, and this change in age limit will retire about 900 men, including several directors and about 50 department executives, the company announced.

Although the names of directors and executives affected by the change have not been made public, it is believed that among the directors who fall within the new age limit are: C. G. Black, E. M. Clark, J. H. Senior and H. Riedmann; also C. T. White, secretary; L. E. Freeman, controller, and C. O. Stillman, president of Imperial Oil, Ltd. of Toronto, a subsidiary.

3-State Marketers Meeting May 25 at Sioux City

DES MOINES—A tri-state meeting of oil marketers, from Iowa, Nebraska and South Dakota, will be held May 25 at the Martin hotel, in Sioux City, Iowa. A similar meeting a year ago was well attended by marketers to discuss the marketing and general problems of that territory.

The Mid-Continent Skyline

By Lawrence E. Smith

The Botts Plan for Saving the Oil Business

(Note: Ellick Botts, consulting pumper, of Gray Horse, Okla., has an idea and when he has 'em, he lets the public in. Our only comment is that the method he suggests may soon be adopted quite generally, and not as a voluntary proposition.—Editor.)

Dear Industry:

The other morning while pondering on this and that I had an inspiration, drawn from something I was reading in the paper, which I think will be the end of our difficulties. Here we have been going along for several years, trying one thing after another—proration, unitization, committees of nine, seventeen and other combinations. We talked about setting aside the anti-trust laws, forgetting that Congress had to be consulted. We investigated the public commissions and investigated the investigators.

Most of this undoubtedly was worked up by the lawyers. It probably was the first made-work program in the country. The courts have been so busy interpreting and nullifying orders of the commissions that really important business like appointing receivers and foreclosing mortgages has suffered.

And all this time the remedy was at hand. It was so simple that nobody has thought of it before.

Take a look at India. When a big problem comes up, do they appoint committees of Hindus, Parsees, Mohammedens, etc.? No. Gandhi simply refuses to eat and in a few days all those millions, regardless of sex or creed, are on their knees imploring the good man just to take a few bites of something and they will do anything he asks. His present fast doubtless will work out the same way. The "untouchables" not only will be admitted to the temples but they will sing in the choir if they want to.

Now, my idea is to use the same methods in the oil business. People hate to see anyone going hungry. In fact, they dislike the thought in this country of anyone's missing a single meal, even though he isn't hungry. A man immediately becomes a pathetic figure if he isn't well stuffed. I think the voluntary fast would get results a lot sooner here than it does in India, where three meals a week constitute a well-balanced ration.

THINK of the effect on the country and the oil business if the newspapers started carrying items like these:

New York, N. Y.—Provoked at the continued low price of crude oil, the Mahatmas W. C. Teagle, H. F. Sinclair and Axtell J. Byles today began a fast that is to continue until at least a two-bit raise is posted. It is probable that one of the three will put the price up himself in a day or two. The Mahatma William R. Boyd, Jr., of the A. P. I., has joined to the extent of going without his breakfast. Several others asserted that they would be glad to help if they could find diapers.

Tulsa — Declaring that only the most drastic measures will end the gas tax evasion racket, the Mahatma E. B. Reeser has embarked on a modified program of fasting. He will eat nothing but parsnips until the tax stealers become honest. The touching spectacle of parsnip eating is expected to right the situation in about three days, or by Thursday night at the latest.

Tulsa—His spirit crushed by the frenzied race for high-octane gasoline ratings, Howard Bennette, president of the Western Petroleum Refiners Association, declared that on May 20 he will begin a voluntary fast of 30 days duration, during which time he will subsist only on fish which he catches. Mr. Bennette, an ardent angler, has placed an order for a 100-foot seine. Secretary A. V. Bourque, of the same association, will observe 30 days of silence and kippered herring to assist Mr. Bennette.

Fort Worth—After fortifying himself with a double sirloin, with French fried and mushrooms, the Mahatma Ed Landreth whistled to his goat and went into "retreat" near Austin. His grievance is the orders which the Railroad Commission writes. He will fast for three days, unless the goat refuses to "give down."

Austin—The Railroad Commission today began a fast in protest against the fast of Ed Landreth and the decisions of the federal courts.

Houston—Three federal judges turned up sulking at breakfast time and refused to eat their cereal until the Railroad Commission starts writing valid orders. As this means certain death, the Humane Society is moving heaven and earth to get the judges chloroformed.

Austin—On behalf of Gov. Miriam Ferguson, Prince Consort Jim Ferguson went without dessert last night in protest against the antics of the legislature, Railroad Commission, attorney general, the courts and the oil industry.

These are a sample of the infinite variety of fasts that could be introduced. The "untouchables" of East Texas, and I

mean this in no ordinary sense, might even be induced to trim their production if some noted eater missed a few meals. Carl Estes wouldn't do as the martyr. He eats little anyway, as the act of mastication interferes with talking.

About the only place in the industry where this wouldn't work is in the independent leasing division. Lease peddlers started fasting two years ago but land department heads offset their fasts by non-buying campaigns and the deadlock still exists.

* * *

The current position of this department is favorable to federal control of the oil industry. Last month this time we were against it. Next week our position will be a neutral one. We believe that a flexible policy is the only one to adopt in these trying times. Whichever way it turns out, we can consistently say that the result coincided with our views.

Kettleman Hills Operators Agree To 60,000-Barrel Production

OPERATING groups in the Kettleman North Dome field have agreed to accept their prorated allotment under the 60,000-barrel daily quota set for the area, but which the operators found considerable difficulty in meeting.

Under the agreement it is provided that 80 per cent of the 60,000-barrel quota, or 48,000 barrels daily will be divided between Standard Oil Co. of California and the Kettleman North Dome Association. These two groups control approximately 95 per cent of the North Dome acreage.

Independent operators in the field—not in the Association—and who control about 5 per cent of the acreage, will divide among themselves the remaining 20 per cent, or 12,000 barrels daily. Under a previous arrangement, Standard and Kenda divided 45,000 barrels between them and the independent group received a quota of 15,000 barrels daily.

With a daily potential production estimated at 269,130 barrels at the end of 1932, a 60,000-barrel quota represented almost 78 per cent curtailment, a program possible only through the unit plan of production.

G. W. Holland, representative of Secretary of the Interior Ickes, has been in conference with operators and landowners on the Kettleman Hills Middle Dome in an effort to work out a unit plan of operation.

Some difficulty is reported in working out the details, for cooperative development of the Middle Dome. Standard of California, holding large blocks of fee land in the area and, therefore, not obliged to join any "plan" is reported willing to co-operate, as it did on the North Dome, but several of the operators object to certain features of the North Dome plan and want these corrected before signing up for land on the Middle Dome.

Since Standard of California recompleted its well No. 6 on the Middle Dome, development has been pretty much in abeyance pending outcome of negotiations with the government.

Petroleum Securities Co. was unsuccessful in cleaning up a fishing job that developed in its Burbank No. 1, discovery wells of the Middle Dome. However, it is expected that this well could be placed in production with little additional work, should restriction be removed.

However, with the daily production in California totaling 475,923 barrels, as of May 10, there is little likelihood that an immediate drilling campaign will be initiated on the Middle Dome.

Of the above state crude production, fields in the Los Angeles basin yielded 251,366 barrels, or more than 30,000 barrels a day in excess of their quota. Fields in the Coastal district were nearly 3000 barrels under their daily quota of 58,500 barrels, and the San Joaquin Valley area produced 169,000 barrels, as compared with a quota of 167,000 barrels.

Move Pipeline Offices to Tulsa

TULSA, May 15—General offices of Oklahoma Pipe Line Co. and Ajax Pipe Line Co. will move to Tulsa from Muskogee about July 1. The move will involve about 50 families.

Lower Simpson Potentials Down at Okla. City

OKLAHOMA CITY, May 13.—Potentials of the lower Simpson zone in the Oklahoma City pool are showing a decline similar to those registered in the Wilcox sand zone a few weeks ago. The 114 wells already tested show a potential of 51,667 barrels per day as against the former figure of 87,085 barrels for the same wells. The average per well slipped from around 800 barrels to 450 barrels, a decline of 40 per cent. The total potential decline for the 413 Wilcox wells was 48.6 per cent.

It is reported that during the last few weeks 43 additional wells in the lower Simpson have begun to make water, thus more than 50 per cent of the wells in the zone are in the salt water column. A decline in potential for the whole zone is expected to be 50 per cent or greater.

Saturated Sand is Found In New "Deepest" Well

LOS ANGELES, May 13—Eleven feet of saturated oil sand with a strong kick are reported from Lillis & Welch No. 1a, now the world's deepest well northwest of the north dome of Kettleman Hills. The well now stands at 10,927 feet.

Drilling is to be continued, possibly to 11,000 feet before a production test is made. No mechanical difficulties have been encountered and all precautions are being taken.

Geologists incline to the belief that the new formation is the Eocene lying below the Kreyenhagen shales. If commercially productive the find will open wide opportunities for deeper drilling at Kettleman Hills, on the Coalinga east side and elsewhere.

Vapor Lock Research Report Before Natural Gasoline Meeting

By Arch L. Foster
N. P. N. Staff Writer

By Teletype
TULSA, May 16

FRANK L. CHASE, Lone Star Gasoline Co., Dallas, veteran gasoline maker, urged the natural gasoline industry Monday to "carry on" in the efforts now being made to stabilize the oil industry, even though they do not always approve all of the plans. In his welcoming address to the Natural Gasoline Association of America convention he sounded also a word of caution regarding the possible evils which may arise from improper use of powers granted or assumed in the control of the over-production evil besetting the industry.

"This is no time to criticize," Chase added, "it is a time to do something to improve conditions. If we do anything at all, we will make mistakes. It is far better to make mistakes and do something, than to do nothing because of a fear of making an error, and thus permit conditions to go from bad to worse, and disagreement with a general plan which may correct some of our bad conditions is no excuse now for non-co-operation to defeat any plan that may be devised."

Voicing his belief that in the future the association will be faced with just as important problems as those already solved, S. S. Smith, Shell Petroleum Corp., retiring president, urged co-operation with the association as the only means of insuring a continuation of the advantages derived from its work of the last 12 years. He outlined the research programs carried through by the Association, the monumental work with Dr. G. G. Brown, University of Michigan, on volatility and other properties of gasoline, completed in 1930 after five years work; vapor lock research with O. C. Bridgeman of the Bureau of Standards, still under way; the development of intelligent specifications, under which all gasoline east of the Rockies is now made and sold; equipment standards, liquefied gas specifications, and several other major problems the solution of which has benefited the industry immeasurably.

The greatest practical difficulty faced by motor fuel makers now on volatility is the wide variation in vapor handling capacity of automotive fuel systems, O. C. Bridgeman said in discussing vapor lock problems. A few cars now operating have practically no vapor handling capacity; over half the cars now running can handle from 10 to 30 volumes of vapor per volume of liquid, and some can handle as high as 40 to 50 volumes, he has found. Further, the flatter the distillation curve at the 10 per cent point the less will be the change in vapor lock temperature with evaporation in fuel lines, he said.

Bridgeman has found that for temperatures below 100 F. the permissible vapor pressure of motor fuels is eight pounds per square inch; below 75 F., 12 pounds is permissible.

Comparing the relative effects of volatility and of octane rating on general fuel performace, G. G. Brown has found that, using the volatility index recently suggested by G. G. Oberfell and R. C. Alden, Phillips Petroleum Co., the effects of numerical value changes in these two yardsticks are about equal, unit for unit. A change of 10 octane numbers in fuel knock rating will have about the same result in general performance as a corresponding 10-unit change in the volatility index of the fuel in the critical range of those fuels. The volatility index is the numerical difference between the 50 per cent distilling temperature and 284 F.

Brown concludes that "the volatility index appears to be reasonably accurate, satisfactory and simple means for expressing the effective volatility of a motor fuel insofar as its general performance in motor cars is concerned."

The anti-knock rating of vapor recovery gasoline blends is higher than that of natural gasoline blends no matter what the test method is, H. M. Trimble, Phillips Petroleum Co., said in presenting extensive research work on this study. Natural gasoline is more lead-responsive than vapor recovery gasoline; the volatility effects of the two materials are practically identical, he found. To meet the new standard for Ethyl, the new test method makes the advantage of natural still greater, and this is expected to be important in the manufacture of "Q" gasoline, he believes.

Disposal of excess volatility was discussed by Emby Kaye, Skelly Oil Co., showing how this problem may be handled to the advantage of the manufacturer and improvement of the total product made. S. S. Smith and L. S. Gregory, Black, Sinalls and Bryson, discussed Raoult's law equilibrium, in a carefully prepared paper outlining the newer developments in this technical problem so important to the plant designer and operator.

The gas testing committee has changed the test conditions for gas going through the apparatus to 14.4 pounds per square inch pressure and 60 F. The apparatus is revised to use a vertical condenser a burner similar to the A. S. T. M. gasoline test burner, a round bot-

Williams Heads N. G. A. A.

By Telegraph

TULSA, May 16.—D. C. Williams of Continental Oil Co., Ponca City, Okla., was elected president of the Natural Gasoline Association of America at the annual convention here today. He succeeds S. S. Smith, Shell Petroleum Corp., who has been president two years.

New vice-presidents of the association elected are Emby Kaye, Skelly Oil Co.; W. E. Reardon, Columbian Gasoline Co.; and R. C. Wheeler, General Petroleum Corp. Mr. Wheeler also is president of the California Natural Gasoline Association.

tomed flask instead of the side tube engler type.

Specifications for liquefied gas are under revision by the committee; no suitable warning agent for this gas has been found so far although the study is being continued. R. C. Alden of the technical committee stated the vapor lock problem is still under study and that soon the committee will publish results of comparing the doctor and the association methods of sweetening, which have shown that the difference between the methods is 0.0003 per cent sulfur.

The sales managers committee warned the gasoline maker that they cannot control their own production, and that the refiner cannot be asked to supply storage for gasoline made during periods of slack demand; the gasoline maker must provide this storage himself.

The Natural Gasoline Supply Men's Association decided to revise the constitution and by-laws so that that group may function with and for the refiners in the same manner as they now work with the Natural Gasoline men. Two luncheons and two evenings of entertainment were provided for the meeting as has been the custom of previous meetings.

Three new directors of the Natural Gasoline Supply Men's Association were elected, Paul M. Raigorodsky, Petroleum Engineering, Inc., B. W. Vinson, B. W. Vinson Co., and G. B. Lane, Foxboro Co.

Motor Car Sales Continue Increase

Peak Expected in May or June

DETROIT, May 13

THE biggest question in Detroit this week is whether the increased automobile production, due to a much more satisfactory volume of sales, is going to keep up. There are many executives among the manufacturers who are inclined to believe that we are at the beginning of a sustained buying period, which is apt to run well along into July before it drops off.

The spring buying season was delayed on account of the bank holiday and on account of bad weather throughout a large section of the country. It has now started and each week for the past eight weeks has been better than the preceding one. From the current outlook it appears that the peak of production will be reached late in May or early in June.

The sales curve has crossed that of a year ago at last. The gains of April over March were as high as 80 to 85 per cent in many plants and generally speaking, the industry was about 60 per cent better in April than in March.

A survey made among DeSoto dealers for combined DeSoto and Plymouth deliveries showed a 4.7 increase for the week of May 6th over the previous week and a 17 per cent increase over the same week of a year ago.

Graham shipments for April show a 16 per cent increase over April last year. Oldsmobile had a better April than any month for almost two years. New car deliveries reached 3776, which is the best in 21 months and during the last 10-day period in April 1627 new cars were sold, which is the highest 10-day period during the last two years. Hupp reports that for the week ending May 6 actual deliveries were greater than any single week since June 24, 1932, and show an increase of 31 per cent over the week ending April 28.

Hudson-Essex is announcing a new larger Terraplane this coming week. The car is a larger edition of the six-cylinder model, being mounted on a 7-inch longer wheelbase than the standard six. The wheelbase of the new Terraplane special six is 113 inches. The engine is the same 70-horsepower unit as is employed in the standard six. The company claims that the new car is the longest and roomiest car in its price field.

The base price of the roadster and business-coupe is $505. The sedan is listed at $575. This gives the company three cars in this low-priced bracket —the standard six, which has a base price of $425, the new special six, with a base price of $505 and the Terraplane eight, which has a base price of $565.

Increased activity may be noticed at the Ford plant these days. Not only have sales picked up to the extent where 2500 of the new V-eights are being made per day, but according to orders placed for steel during May it is anticipated that production will be increased this month. Ford is advertising again for the first time since March, 1932. Buick in Flint, Michigan is running six days a week this month as against four days formerly. According to William Huffstader, General Sales Manager, Buick sales are returning in a very satisfactory manner since the introduction of the new model and at the present time, according to Huffstader, Buick is getting a larger percentage of business in its price class than at any time in the history of the company. It is reported that there are 3900 orders on the books, while in May, 1932, the count was 2913 for the full month.

The trend toward short wheelbase seems to be definitely arrested for the time being, in fact some of the companies which went to 106 and 107 inches are retreating, at least, to the extent of bringing out models of longer wheelbase. The new Terraplane, for instance, is 113 inches as against 107 inches for the standard six. Ford has a 112-inch wheelbase which is longer than has ever been used by this company. Chevrolet has gone to 110 inches; Plymouth 112 inches on its deluxe series and Dodge 115 inches. Pontiac is also 115 inches. Rockne is 110 inches. This is a contrast with Ford formerly at 100 inches and Chevrolet 102 inches.

It looked for a while earlier this year as if there might be a definite swing toward the short wheelbase, but apparently this has been arrested and the tendency is the other way.

Range Burners May Open New Market For Oils in Many Sections

TULSA

THAT the range oil market developed in New England during the past eight years, which required more than 200 million gallons of oil in 1932 "can logically be expected to repeat itself quite generally in various sections of the entire country" was one of the conclusions of an address by L. F. Speare and C. B. Cooley, Gilbert & Barker Mfg. Co., Springfield, Mass., on "The Range Oil Burner—Creator of A New Market" at the midyear meeting of the American Petroleum Institute.

Range oil is burned in installations for cooking, heating small homes and for hot water heaters. Development of the heating unit and the oil has been concentrated in New England states so far.

"Practically all range oil burners are constructed on the same basic principles, but differ in certain features of design which greatly affect their performance. In general, the complete unit as installed in the kitchen range consists of three parts," the authors said.

"1. The burner proper where the oil is vaporized, mixed with the necessary amount of air, and burned.

"2. The regulating valves which control the volume of flame or the rate of combustion.

"3. The oil reservoir which may differ in form according to the demands of the particular installation.

"In the simplest form the burner itself consists of a base, usually of cast iron formed of two or more annular fuel-vaporizing grooves with alternate air channels. This base is surmounted by a series of concentric perforated cylinders or sleeves of which each pair forms a combustion chamber above its own vapor groove.

"The sleeves are made of a special high-chromium alloy steel, particularly adapted to resist the effect of continued heat. The temperatures encountered vary from 1200 to 1750 F. with a reducing atmosphere on one side of the steel and an oxidizing atmosphere on the other. A reinforced asbestos ring is usually placed in each groove for ease in lighting. One or more cover plates resting on the top of the nested cylinders baffle the flame and, by closing the air passage, force the air through the perforations into the gas chamber.

"In this construction the usual relationship of combustible and supply of oxygen is reversed; an examination shows innumerable jets of air surrounded by an atmosphere of vaporized oil. This form of progressive combustion is noiseless, and gives a clean blue flame of intense heat with no smoke, soot or odor.

"In starting the burner the valves are opened, and the fuel in the asbestos rings is lighted with a convenient torch. The base temperature rapidly rises to the vaporizing temperature of the oil and, by the process of distillation, supplies each combustion chamber with a continuous flow of oil gas. In five to ten minutes the burner will have reached a full flame, and the valves are adjusted for the desired amount of heat.

"The major differences in burner designs lie in the construction of the base and the method used in vaporizing the oil and distributing the resulting gas. In one class the oil is fed to a central vaporizing cup; and, after the initial heating-up period, gas only is allowed to flow to the vapor grooves. In another design the vaporizer takes the form of a wide annular trough, where vaporizing of the fuel takes place. In a third class the oil is fed directly to the outer fuel groove, where it is vaporized and fed to the other grooves. With this latter method the amount of oil in the base is held to a minimum, making the burner particularly responsive to the control valves.

"Many modifications of these basic types have been made, each design having good features and some disadvantages. In all designs of either type it is necessary to give considerable attention to the formation, position, and ease of removal of carbon deposit. The design must be such that distillation takes place at a relatively low temperature to avoid thermal decomposition which would result in a great increase in the amount of carbon residue formed.

MARKETING organizations in many sections of the country will be vitally interested in this paper on the potential oil market that may be developed by the range burner for cooking purposes, heating water, and small home heating. The paper concerns developments of the New England market. A similar potential market exists in other sections for a new oil market and for the industry aiding the distribution of burners.

Reasons for Development

"Range burners in the majority of cases have been used for cooking and room heating, and up to the beginning of the year 1932 were for the most part installed in the customers' present coal or wood stoves.

"The most rapid advance in the use of range burners began with the year 1930, and the volume of business has practically doubled each succeeding year in the New England territory."

Several new products have

been brought out since 1931 in adapting the range burners to complete units, the address continues. Developments given include the circulating and radiating-type room heaters; the first storage water heaters in 1932, both automatic and manually operated; the first showing of oil burning kitchen ranges complete with burners in 1932; and the outstanding feature of last year, the vaporizing burner of a type and size suitable for heating a cottage home or a bungalow; and the new products in the accessory field.

Quality of Oil Important

"Experience with fuel for use in range burners since 1924 has resulted in a great advance in fuel quality in the New England area. Kerosine, until recently, has been recommended almost universally as the most satisfactory fuel for use in range burners; but prior to 1932 even this fuel was responsible for a great deal of trouble with range burners, due to improper oil specifications.

"It is probably safe to say that during the year 1932 greater advances have been made by major oil companies in developing this special fuel to better qualify for this particular requirement than has been true of the entire prior period.

"The question is often asked by a customer as to whether No. 1 fuel oil is a satisfactory fuel for use in this type of burner; and, while such a fuel can be vaporized and burned in a range burner it is generally classed by most manufacturers as an unsatisfactory fuel, due to the tendency to rapidly build up carbon deposits in the vaporizing grooves, thereby requiring frequent cleaning of the burners.

"It is impossible to give a direct answer to the question as to what constitutes an oil which will be entirely satisfactory, or one which approaches the border-line. Experimental work has shown that satisfactory oil can be produced only by proper selection of the crude fraction, followed by careful refining throughout every step of the finishing operation, to eliminate high-boiling fractions and corrosive constituents.

"Gravity, color, and distillation range of the final product are not sufficient guides to use in judging the performance characteristics of the oil. Care in every step of the manufacturing operation is essential. Yet the satisfactory performance of these burners is absolutely dependent upon the use of a satisfactory grade of fuel.

Range-Oil Marketing Methods

"Exact figures giving the total annual range-oil gallonage for this territory from all sources of supply are not available. Experience, however, indicates that where range oil burners are used generally for cooking and heating purposes the year round an average annual consumption approximating 500 gallons per installation can be expected.

"On this basis, with a total of approximately 590,000 burners representing production for the last three years, it is obvious that the range-oil gallonage delivered to customers in the New England states is running in excess of 200,000,000 gallons annually at the present time.

"The rapid increase in the use of range burners during such a comparatively short period of time has resulted in the development of a most unique and unusual distribution system for the delivery of range oil to customers. The growth of this market was not visualized promptly by the major oil companies in this area, with the result that a large percentage of the distribution is being handled by jobbers purchasing in tank car lots.

"A large percentage of coal companies, ice companies, and the like are acting as range oil jobbers. Peddlers of all kinds are serving the public through these jobbers. It is a common sight to notice a great variety of trucks on which storage tanks have been mounted, and by this means are peddling range oil to customers.

"Some of the better grade companies in the range oil business have purchased small trucks, and have equipped them with relatively small-capacity tanks of the latest tank-truck design with built-in pumps and meters having a hose reel carrying as much as 100 feet of hose, equipped with a shut-off nozzle. It is an actual fact that in one of the larger cities in Connecticut during the past season range oil has been delivered to customers from 50-gallon drums equipped with a shut-off nozzle mounted on push carts.

"In tenement houses in the industrial centers it is common to find 50-gallon drums serving as storage for range oil located on porches, in kitchens, and in cellars. For tenement-house work, those peddlers having tank trucks equipped with a meter and 100 feet of hose are enabled to simplify customer deliveries.

"The usual practice is to walk up the two or three flights of stairs, pulling the hose along, and by means of the shut-off nozzle control, fill the drum, returning to read the meter for the exact quantity delivered. This type of equipment has obvious advantages over the bucket method, which some of the less fortunate peddlers are compelled to use.

"It is also possible to secure range oil at many service stations in this area, and it is not uncommon to see persons carrying a two or three-gallon bottle down to the service station to secure the daily supply of range oil."

The authors suggested that the oil industry in other parts of the country should watch the development of the market for range oil carefully and keep their distributing facilities in line with demand so that New England mistakes will not be repeated elsewhere.

Outlook in Other Sections

"While it is a fact that the majority of manufacturers have centralized most of their effort in New England, investigations indicate that a large potential market exists in the middle western and north central states. This particular market differs from New England, however, in that it covers greater area, a large portion of which is rural. Gas is quite commonly used for cooking in this part of the country, although coal stoves are used for heating. This would indicate that the demand in that territory will call for complete units of the circulating heater type with built-in range burners.

"Considerable pioneering work has already been under-

taken in this territory by several of the larger manufacturers. We believe that it is a common opinion that the distillate burner market is largely found in rural sections, and there is no denying that the rural market is of great importance.

"Metropolitan areas, however, present a market of great importance, particularly where a large foreign element is concentrated in tenement districts. Economy and habit leady many people of this type to do their cooking and heating with coal and, where the cost of oil permits no particular increase in cost of operation, range oil burners can be sold in such areas.

"The most important factor to the rapid promotion of sales of range burners in this middle western territory will be the availability of suitable range oil for this purpose. Surveys conducted by several of the prominent range burner manufacturers indicate that lack of this type of fuel is proving the most serious handicap in promoting range burner sales.

"It is our opinion that a general announcement that suitable range oil is available in middle western territory, at prices somewhat comparable with those prevailing in New England, would result in a tremendous increase in the adoption of range burners, which would obviously bring its benefit to those companies who lead in making this particular grade of fuel available to consumers."

The four general methods of range burner distribution given are direct dealers such as coal and wood companies; distributors who have large dealer organizations; manufacturers' agents who develop their own dealers; and the major oil companies marketing direct to the consumer. Time payments are usually provided in New Englad, over a year, but a surprising number are sold for cash. The leasing of burners to customers has been tried by a few oil jobbers, it proved ineffective, and the practice has been largely abandoned.

Comparative Operating Costs of Various Fuels

Table 1 furnishes a basis by means of which general comparisons can be made indicating that the combination of range oil burners and range oil can compete with the principal competitive fuels. This comparison is based on five different prices for range oil, anthracite coal, manufactured gas, and electricity.

"In order to make a comparison between oil and any other fuel it is necessary to know the fuel prices. Inasmuch as there is a very wide range of fuel prices throughout the country, it is necessary to show the prices for each fuel in a separate group. The fuel prices for any section of the country can then be compared.

"Figures in table 1 represent tests conducted on a storage water heater which is operated by a 'built-in' range burner, and illustrate the number of gallons of hot water raised in temperature from 60 F. to 140 F. that can be obtained with one dollar's worth of the different fuels at prices shown.

Summary

"From the foregoing we can draw the following conclusions as being of particular significance to the oil industry:

"1. The volume of oil business developed in the past eight years through the influence of range burners in the New England states alone, where approximately 90 per cent of all the range burners produced to date have been installed, can logically be expected to repeat itself quite generally in various sections of the entire country.

"2. The marketing of range burners in territories outside of New England for the most part is still in the pioneering stage, due to the unfamiliarity of the public in general with this important new development.

"3. The fact that the majority of this large New England range oil business up to the present time is in the hands of oil jobbers, handling tank car lots purchased from the major companies, affords an opportunity to those who can visualize the possibilities in territories outside of New England to profit by this experience and plan for the development of distribution facilities to keep pace with the growth of range burner distribution in your respective territories.

"4. The results obtained recently in the case of one or two large companies who have entered the field of selling range burners direct to the consumer, with a plan which is predicated on furnishing the oil requirements of the customer, should be given serious consideration. This plan permits a profit from the sale of the burner as well as the possibility of controlling an important share of the oil business thus created.

"5. Finally, we wish to emphasize the desirability of directing the attention of the oil industry to the further improvement of fuels for use in this type of burner. As has been previously mentioned, oil companies operating in territories where the range oil burner can be logically expected to assume importance in terms of volume distribution—where good range oil is not now available—and who prepare to market oil meeting these requirements, will unquestionably obtain liberal reward for their efforts."

Table 1

Comparison of Hot Water Heating Costs—Number of Gallons of Hot Water for One Dollar

	Gallons of Water
Range oil or Kerosine	
$0.08 per gallon	1,910
$0.10 per gallon	1,528
$0.12 per gallon	1,272
$0.14 per gallon	1,090
$0.16 per gallon	955
Anthracite Coal	
$ 8.00 per ton	1,625
$10.00 per ton	1,300
$12.00 per ton	1,082
$14.00 per ton	924
$16.00 per ton	813
Manufactured Gas	
$0.50 per thousand cubic feet..	1,170
$0.75 per thousand cubic feet..	844
$1.00 per thousand cubic feet..	633
$1.25 per thousand cubic feet..	506
$1.50 per thousand cubic feet..	421
Electricity	
$0.02 per kilowatt hour	243
$0.04 per kilowatt hour	121
$0.06 per kilowatt hour	81
$0.08 per kilowatt hour	60
$0.10 per kilowatt hour	49

New Solvent Methods of Wax Removal are Described at A.P.I. Symposium

By Arch L. Foster
N. P. N. Staff Writer

TULSA

NEW processes for the removal of wax from paraffin distillates and residual oils, by the use of liquid propane, trichlorethylene, and benzol-acetone mixtures were presented before the American Petroleum Institute at its third midyear meeting here this week.

Four papers were presented in a symposium dealing with the important new developments on this technical problem, which indicate a "new deal" in the methods for wax removal which heretofore has almost universally employed light naphtha as the solvent or diluent for centrifuging to remove paraffin hydrocarbons of high melting point.

Research to find other solvents for this purpose has been stimulated by the need to reduce fire hazard incident to the use of petroleum naphtha, to obtain solvents or diluents of greater solvent selectivity, and to produce solutions which show a wider margin between specific gravities of the two components to be separated in removing the wax.

The S-N Process

The Separator-Nobel Co., Stockholm, Sweden has been investigating the problem of centrifuging petroleum products using heavy solvents, and recently offered to the refining industry the S-N process with the use of trichlorethylene as that solvent best suited to the purpose.

It is claimed for this process that it will give greater throughput per machine, according to Carl F. Pester, of Standard Oil Development Co., who discussed the method. Lower dilutions of solvent, higher chilling rates, and a more narrow spread between the pour point of the dewaxed oil and the centrifuging temperature are also claimed, the author stated.

The new solvent is water white, has a specific gravity at 32 F., (referred to water at 39 F. or 4 C.), of 1.4996, of 12.25 pounds per gallon. It boils at 188 F., and freezes at minus 126 F. The solubility of water, in trichlorethylene, is 0.017 grains per 100 grams of solvent at 50 F., 0.035 grams per 100 grams at 82 F.

The author shows that operating costs, using trichlorethylene as dewaxing solvent, should be, for 100 gallons of distillate, about $1.40-1.50 for low wax content stock, and $2.10-2.20 for high wax content oil.

The S-N centrifuge shows to advantage with low wax content, and undecolorized stocks.

The solvent is non-inflammable, and some of its advantages are:

High specific gravity, permitting storage under water to reduce evaporation losses.

It does not hydrolyze, does not decompose in darkness, or in light in the presence of anti-oxidants.

It is non-corrosive in presence of anti-oxidants.

It is not poisonous, but has an intoxicating effect on the human system.

The new process is particularly advantageous for processing oils of low wax content, and has shown that it will handle partially-refined stocks with about that same throughput and results as with stocks completely refined. Cloud points of dewaxed oils are quite close to the pour point, it is stated, the difference being about five degrees F., usually.

It is further indicated, the author stated, that continuous chilling should be possible with the new method. Higher chilling rates permit the use of smaller chilling drums, and the contamination resulting from changing stocks being operated on is correspondingly smaller he stated. The operating cost of a continuous chilling system is about 15 per cent lower than for batch chilling, he stated, and the plant cost will be about 20 per cent lower, with only half as much solvent needed for normal operation.

THE description of the plant setup required for this process is given in the author's words as follows.

"In designing plants for high-pour feed stock, the trichlorethylene should be heated to about 120 F. in a commercial exhaust-steam pre-heater and pumped through a mixing column with the feed and then through a commercial cooler in which the solution should be cooled to about its pour point.

"The solution should then flow through the chillers, entering at the top and leaving at the bottom to prevent heat convection currents. The chiller volume should be based on a chilling rate of approximately 12 F. per hour. It is probable that higher chilling rates may be permissible; however, this fact has not been definitely determined. Actually, much higher chilling rates are not possible with the internal coil-type chiller; as the coil surface required fixes the minimum size of the tank and, thus, sets the maximum chilling rate at from 10 to 15 F. per hour.

"The chillers should be equipped with agitators in the top. The last chiller should be

slightly elevated, and the level maintained just below the top by means of a level controller operating the feed pump. The solution can then flow from the last chiller to the centrifuges with no intermediate feed tank. Connections should be provided on each chiller, so that the solution may be pumped from one chiller to any other chiller.

"The centrifuges are totally enclosed; and, accordingly, very little trichlorethylene vapor should be present in the centrifuge room. The petrolatum is melted in the centrifuge by means of closed exhaust-steam coils. This eliminates the usual petrolatum-water settling tanks and hot-water circulating system.

"In view of the simple operation of both the centrifugal plant and the solvent-removal still, it is feasible to have these two units operating integrally. This procedure eliminates the intermediate storage tanks, and thereby decreases handling and evaporation losses as well as the quantity of solvent necessary in stock. For feed stocks having a small percentage of petrolatum, the petrolatum discharged from the centrifuge may be stored and run into the solvent-removal still when the centrifuge plant is down. However, for feed stocks containing reasonably large percentages of petrolatum, a separate petrolatum solvent-removal still should be used.

"The still should be designed for exhaust-steam heating, so as to prevent a high-film temperature; and the maximum temperature to which the solvent is subjected should be 230 F. The solution should be preheated to about 165 F. by means of the over-head solvent vapors, and then further heated to 230 F. with steam in a special shell-and-tube vaporizer and flashed into the tower. Between 80 per cent and 90 per cent of the solvent present (depending on the mol per cent in the solution) will be vaporized in this heater.

"The tower need have only entrainment baffles above the point of flash, but should have about 10 bubble-cap trays below this point. Exhaust steam (about 1 lb. per gal. of oil) should be used in the bottom of the tower as a stripping medium. In view of the large quantity of solvent remaining in the oil at the point of flash, some auxiliary heating means must be provided just below this point to supply the required latent heat of the solvent and prevent the condensation of steam. The solvent-free oil from the bottom of the tower should be flashed into a vacuum drum for the removal of entrained moisture, so as to give a bright stock."

Table 1

Installation and Operating Costs for Two Types of S-N Dewaxing Plants

Oil charge to plant, gallons per hour	100	100
Trichlorethylene-oil dilution	45:55	60:40
Water, gallons per minute	20	40
Exhaust steam, pounds per hour	270	390
Live steam, pounds per hour	60	90
Power, kilowatts	8	19
Solvent loss, % by volume on oil charge	0.6	0.9
Approximate plant cost, dollars per 100 gal per hour	$30,000-$35,000	$55,000-$60,000

The accompanying Table 1 shows the proportionate costs of two types of plants employing the S-N process; the first case is for processing oils of low wax content, the second for oils containing 20 per cent of wax. The author stated it should be easy to operate such a plant wth three men, one for the dewaxing machines, one for pumps and refrigeration, and the third for the solvent-recovery still. It is noted that, for high wax content operation, the plant installation cost is approx-

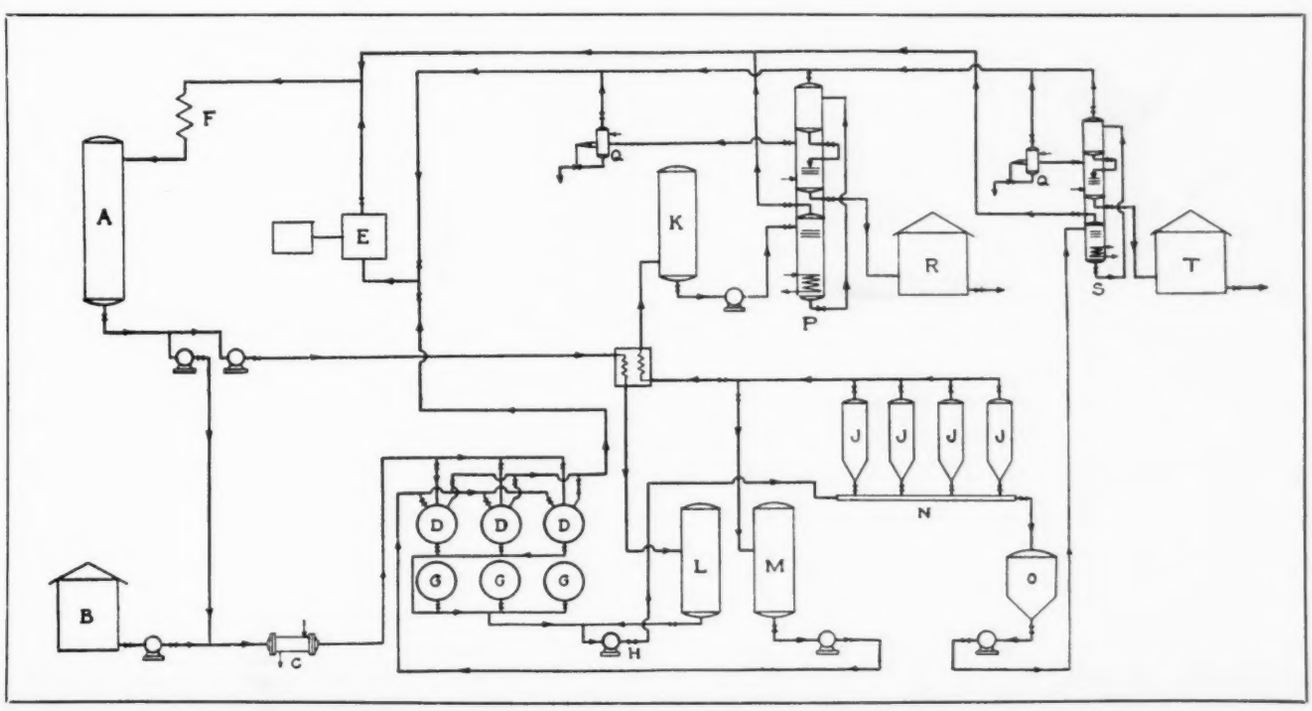


Fig. 1—Flow diagram of self-refrigerating dewaxing plant at Standard of Indiana's Wood River Refinery

imately twice that for oils of low wax percentage.

Benzol-Acetone as Solvent

This process, developed during the last several years by Dr. Francis X. Govers and associates of the Indian Refining Co., now a subsidiary of The Texas Co., employs this solvent mixture in the same general principle as others used for wax removal. The mixture is 35 per cent acetone and 65 per cent non-corrosive, "90 per cent" benzol, and is stored in vapor-tight containers.

In operation the solvent is pumped first to the mix tank, to which is added the requisite amount of wax distillate and the two agitated at a temperature between 70 and 90 F. This solution is pumped through continuous chilling equipment, exchanging first with pressed distillate solution from the presses, ingoing solution reaching a temperature of 25 F.; next brine cooling is employed to attain the desired pressing temperature, passes to a surge tank from which the pressure maintained on the tank forces the solution through the presses. Both press cake and pressed solution are sent then to separate storage and to strippers, where the solvent is removed.

The entire system is made up with welded or at least vapor-proof joints, and the claim is made that the solvent loss is a practicable minimum.

"The process is unique," the authors stated, "in its ability to produce dewaxed oil having a pour test not substantially higher than the temperature at which filtration takes place." They stated that for an oil to have a pour point of 0 F. or minus 5 F., the solution is cooled to a temperature of from three to five degrees F. below that pour point.

Not more than 2000 barrels of solvent are required, they said, to operate. The plant charges 1200 barrels of wax distillate per day of oil of 75-80 viscosity @ 210 F. and a 4-1 mixture ratio. The per-cycle solvent loss at Lawrenceville, Ill., where the process has been in operation since 1927, is 0.2 per cent of the quantity of solvent in the system. When charging oil of 200-250 viscosity @ 100 F., to attain a minus 10 F. pour point, at a solvent-to-oil ratio of 3-to-1, the plant charges 1800 barrels of wax distillate per day, which figure does not include solvent used.

The authors stated that particularly interesting results are obtained by dewaxing with this process a wide cut fraction which contains all the portions required for motor car lubrication, later fractionating to produce the various S. A. E. grades needed for commercial lubricants. These fractions, they say, do not contain the light ends of the neutrals nor the heavy, carbon depositing portion of the undistilled residual component of blended oils. Table 2 gives the inspections of six motor lubricant grades so manufactured.

The inventor of the process stated that the method is applicable to a wide range of wax-bearing stocks, from close-cut neutrals and motor stocks to a total lubricating fraction distillate. The process is adaptable to production of pour points varying between 0 F. and minus 40 F., with little change in operation or equipment. No corrosion has been experienced in six years of use, he stated, and no pressures above 45 pounds per square inch are required.

Table 2

Motor Lubricants De-Waxed by Govers Process in One Fraction

	S.A.E. Grades					
	10	20	30	40	50	60
Gravity, deg. A. P. I.	24.5	24	23.8	23.7	23.0	22.6
Flash point, F.	405	425	455	480	505	540
Fire point, F.	460	485	520	555	585	620
Viscosity at 210 F., S. U.	47	52	61	70	91	117
Pour point, F.	—5	—5	—5	—5	—5	—5
Cloud point, 0 F.	None	None	None	None	None	None
Carbon residue, per cent	0.05	0.06	0.19	0.24	0.65	0.94
Color, Lovibond—½-in. cell	.....	.....	.....	40	70	140
6-in. cell	140	140	250	.....	.....	.....

Regarding the equipment required, it is stated:

"All equipment used in constructing and operating a solvent dewaxing plant is available in the open market. Standard ammonia, compression, or absorption plants are well suited for the refrigeration equipment. Due to the high percentage of refrigeration recovered by the exchangers, and to the fact that the chilling temperatures are moderate, investments and operating expense are at a minimum. The evaporating pressure with the ammonia plants is above atmospheric in producing all oils to —15 F. pour point.

"Operating the ammonia system on a positive pressure eliminates all necessity of purging and difficulties with high head pressures or infiltration of air into the ammonia system. Heat-transfer rates average between 20 and 30 B.t.u. per sq. ft. per hour, per degree of Fahrenheit in the chilling system. These high rates of transfer reduce the investment required for chilling equipment.

"Filter rates average from 0.3 bbl. of oil per sq. ft. per day for the heavier distillate to 0.5 bbl. of oil per sq. ft. per day for the lighter distillate. Again, these rates are net oil content, and include the blowing and dumping time. Actual filtering rates are 45 per cent higher than the above figures."

"Self-refrigeration" Said to Reduce Costs

Erection and operation of a 1300-barrel-per-day plant for dewaxing motor lubricant distillates, using the evaporation of the solvent, liquid propane, as refrigerant, is the result of research by Standard Oil Co. of Indiana laboratories into the feasibility of this method of chilling solutions. The details of this process which chemists of that company developed was discussed at the symposium.

Experimental work with wax distillates dissolved in propane in proportions ranging from 17 to nearly 50 per cent of oil, showed that the process is remarkably simple, W. H. Bahlke and associates, who presented the paper, stated, and the commercial plant is the result.

Very high chilling rates are obtainable by the process the

authors stated; a practical limit is set on the rate of chilling, as it was found that the crystal structure of the mass, obtained when reducing the solution from 95 F. instantaneously down to minus 40 F. temperature by reducing the pressure to atmospheric, was so very fine that the result is an unfilterable distillate.

OPERATION of the commercial plant is as follows (the capitals refer to the accompanying flow diagram):

"Propane from the storage vessel *A* is mixed with oil from the tank *B*, and the combined stream pumped through a heater *C*, wherein the mixture is heated with steam to a temperature of about 130 F. The combined stream is then discharged into one of the chilling vessels *D*, until the drum is about three-fourths full — at which time the stream is diverted to another chilling vessel.

"Chilling in the vessel is accomplished largely by evaporation of a portion of the propane, but is aided somewhat by the slow introduction of cold propane (—40 F.) from tank *M*, which has been used to wash the filter cake on the leaf. The evaporated propane is compressed by compressor *E*, and is condensed in *F* to return to the storage vessel *A*. Following the chilling the cold mixture is discharged to one of the storage vessels *G* which acts as a reservoir for the pump *H*.

"In operating the plant the chilling drums are charged in rotation; thus one drum may be filled while the second is being chilled; the third being ready for discharging to the cold-oil storage drums. A complete cycle of charging and chilling requires about 90 min. Final chilling temperature is —40 F., and filtration is carried out at this temperature.

"The chilled mixture is pumped under 50 lb. pressure into the presses *J* through the bottom, the filtrate passing to the storage tank *K*. When the desired quantity of mixture has been filtered, the excess mixture in the presses is drained to the storage vessel *G* with the aid of propane vapor (at about 10 lb. pressure) introduced at the top of the press. Cold propane is then pumped into the presses from the storage vessel *L*. This propane has been cooled by heat exchange with the outgoing filtrate and by self-evaporation.

"When the desired quantity of cold propane has been pumped through the filter cake into tank M, the excess is drained from the press to the storage vessel *L*. After having been washed thus, the wax cake is discharged by means of a back blow of propane vapor through the leaves. By this operation the cake is discharged through the conical bottom section of the presses into the screw conveyor *N*, which carries it to the wax storage tank *O*.

"Propane is recovered from both filtrate and wax by distillation. The oil is pumped into the distillation sypstem *P* where the bulk of the propane is removed by distillation under 200 lb. pressure—using closed steam as a heating means. Propane is condensed in the water-cooled condenser *F*, and returnd to the storage vessel *A*. From the 200-lb. section the hot-oil solution containing a small amount of propane is throttled to atmospheric pressure and stripped with steam.

"This steam is condensed in a jet condenser Q, and the uncondensed propane is re-compressed and condensed in *F*. The dewaxed oil is finally stored in tank *R*. A similar system for separating propane from the wax is shown at *S*, the wax being finally stored in tank *T*.

"The flow diagram does not show in all cases the number of units for each type of equipment. Specific exemptions are the compressors and filters. The plant as constructed comprises eight presses (operated in two batteries of four each) and three compressors. The two batteries of presses have separate charging pumps and lines. The service of the compressors will be described later.

"The presses are vertical cylindrical vessels, each containing 11 canvas-covered rectangular leaves. The bottom section of the press is conical, connecting to the screw conveyor; and the top is equipped with a dished head, which is flanged to facilitate occasional removal for repairs. Discharge from each leaf may be diverted through a sight glass for observation when such seems necessary from observation of the master sight glass."

Filter pressures may be varied over a wide range, it is stated, but apparently from the paper they are of the order of 50 pounds per square inch. Commercially the plant has been used for motor oils ranging from S. A. E. 10 to 60. Steam refined and other residual stocks have shown as good dewaxability and as high filter rates as those found for distillates processed, the authors stated. The use of pour point depressors tried out in the oils filtered showed higher yields and filter rates, in some cases, it is said.

THE investigators stated they have found that by a modification of the process it is feasible not only to dewax the oil but to remove all asphaltic material as well from the oil. Settling of chilled oil in propane or butane solution gives a product both wax- and asphalt-free; settling at two different temperatures affects good separation between wax and asphalt.

While batch chilling and pressing operations are employed at present in the commercial plant, the authors stated that continuous methods for both these operations are under investigation, and results indicate that as good, probably better operation may be had in continuous operations.

Laboratory Control of Dewaxing

Optimum results in operating a dewaxing process demand close laboratory supervision, according to L. L. Davis and D. S. Campbell, Continental Oil Co., and Continental dewaxing operations are so controlled. The laboratory method and technique developed by the Tidewater Oil Co. has proven highly satisfactory in Continental's work, they stated.

In this method, a drop of the distillate to be studied is placed in the depression of a microscope slide, and inserted in a water-jacketed hot stage in a photomicrographic apparatus equipped with Nicol prisms. A thermometer is placed in the air just above the slide, which is covered with a celluloid strip

(*Continued on page* 148)

Liquid Asphalt Road Materials Specifications Proposed

TULSA

SALE of unsatisfactory liquid asphaltic road materials by one manufacturer has such injurious effects on the entire market for these products that stringent specifications are imperative, for the benefit of all manufacturers of petroleum road building products, is the opinion of Prevost Hubbard of the Asphalt Institute, expressed before the American Petroleum Institute at its midyear meeting in Tulsa, May 17-19.

Three classes of asphaltic road materials are recommended by this author, and by E. F. Kelley of the U. S. Bureau of Public Roads, who presented the recommended specifications for 13 grades of these materials to the meeting; slow-curing medium curing, rapid-curing materials meet the different requirements for various purposes, these classes being divided into 13 grades in the specifications. In the accompanying table not only the test specifications but the specific uses for each grade is recommended for the guidance of maker and buyer.

These classes are intended each for a different use. Slow curing products are for dust laying, where it is necessary for the material to coalesce with finely divided particles on the road surface, and to supply a fairly strong bond, yet not solidify too quickly.

Medium curing materials are for primers, to impregnate an aggregate thoroughly, and to furnish a base, which hardens fairly quickly, for the heavier carpet builder laid on top. Rapid-curing oils are to cover the roadway, furnish a heavy solid or semi-solid carpet as a permanent surface.

Slow curing materials are heavy, with little if any distilled off at 680 F., should not harden to any extent after application. Medium-curing material is a low viscosity asphalt cut-back with a light naphtha or distillate. Low viscosity is needed to permit the oil to permeate the base aggregate, the light naphtha evaporates quickly to harden the material in preparation for the carpet coat. Since the rapid curing material does not need to penetrate fine aggregate and is exposed to the weather, it is cut back, but to a higher viscosity than the medium class.

It was stated that considerable difficulty had been experienced in inducing users to adopt the new type of tests recommended. These tests, and the specifications based on them, are the result of more than two years research by the road material manufacturers in co-operation with road builders.

The following methods are recommended by the Bureau of Public Roads and the Asphalt Institute for testing materials under these specifications.

1. Flash point:

a. Cleveland open cup for materials having a flash point of 175 F. or more (A.S.T.M. Method D92-24).

b. Tagliabue open cup for materials having a flash point of less than 175 F. (method as approved by the Bureau of Explosives and the Interstate Commerce Commission).

2. Consistency:

Viscosity, Furol, at 77 F., 122 F., 140 F., or 180 F., depending on the viscosity and other characteristics of the material (A.S.T.M. Method D88-30).

3. Distillation:

Total distillate, by volume, at the temperatures of 437 F., 600 F., 680 F., and in special cases at 374 F. (A.S.T.M. Method D20-30 with modifications.

4. Tests on residue from distillation:

a. Float test at 122 F. on all residues having a float of more than 25 sec. at this temperature and having a penetration of more than 300 at 77 F. (100 g., 5 sec.) (A.S.T.M. Method D139-27).

b. Penetration at 77 F. on all residues of less than 300 penetration (100 g., 5 sec.) (A.S.T.M. Method D5-25).

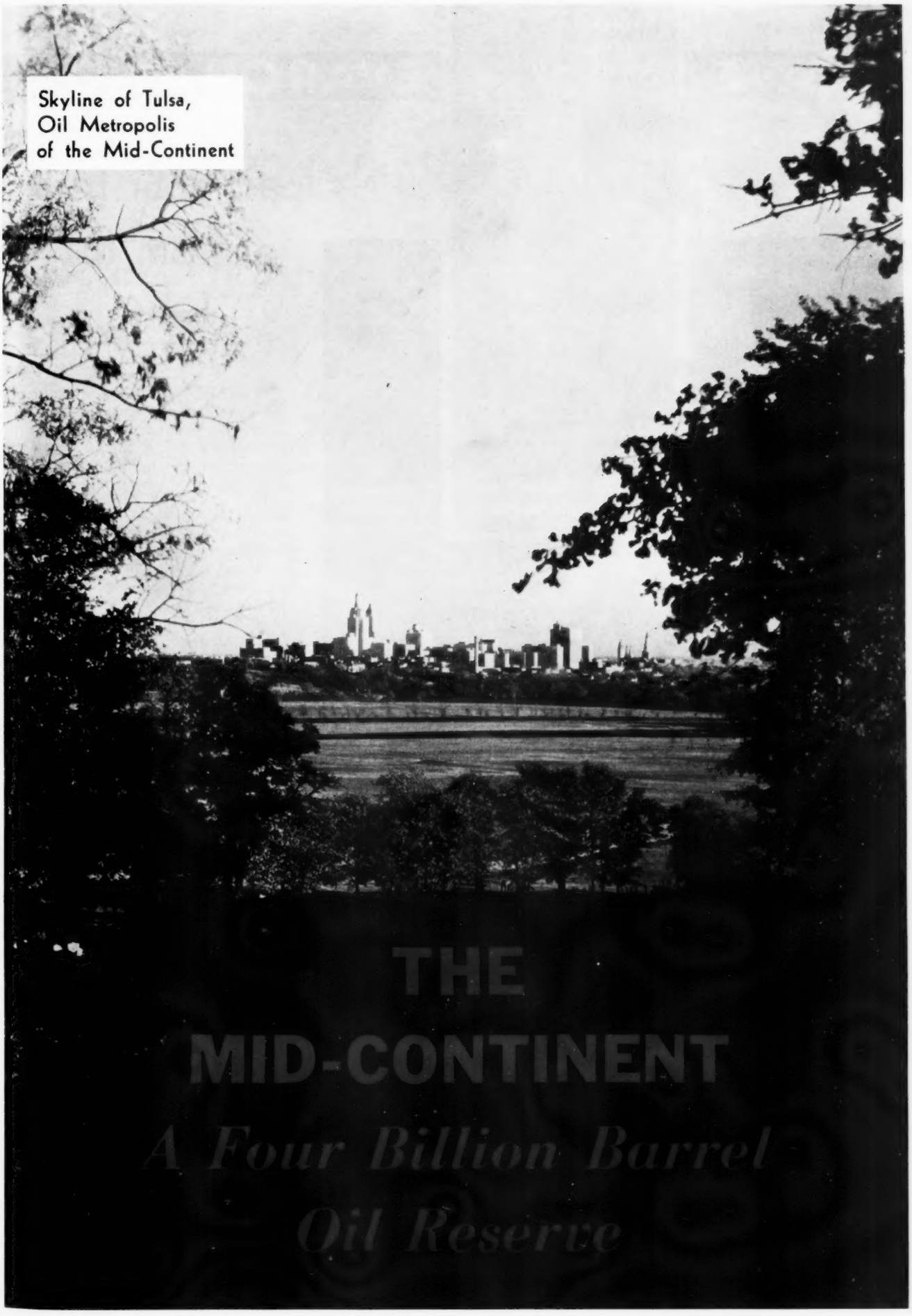
c. Ductility at 77 F. on all residues of less than 200 penetration at 77 F. (100 g., 5 sec.) (A.S.T.M. Method D113-32T).

d. Solubility in carbon disulfide—all residues (A.S.T.M. Method D4-27).

Table 1

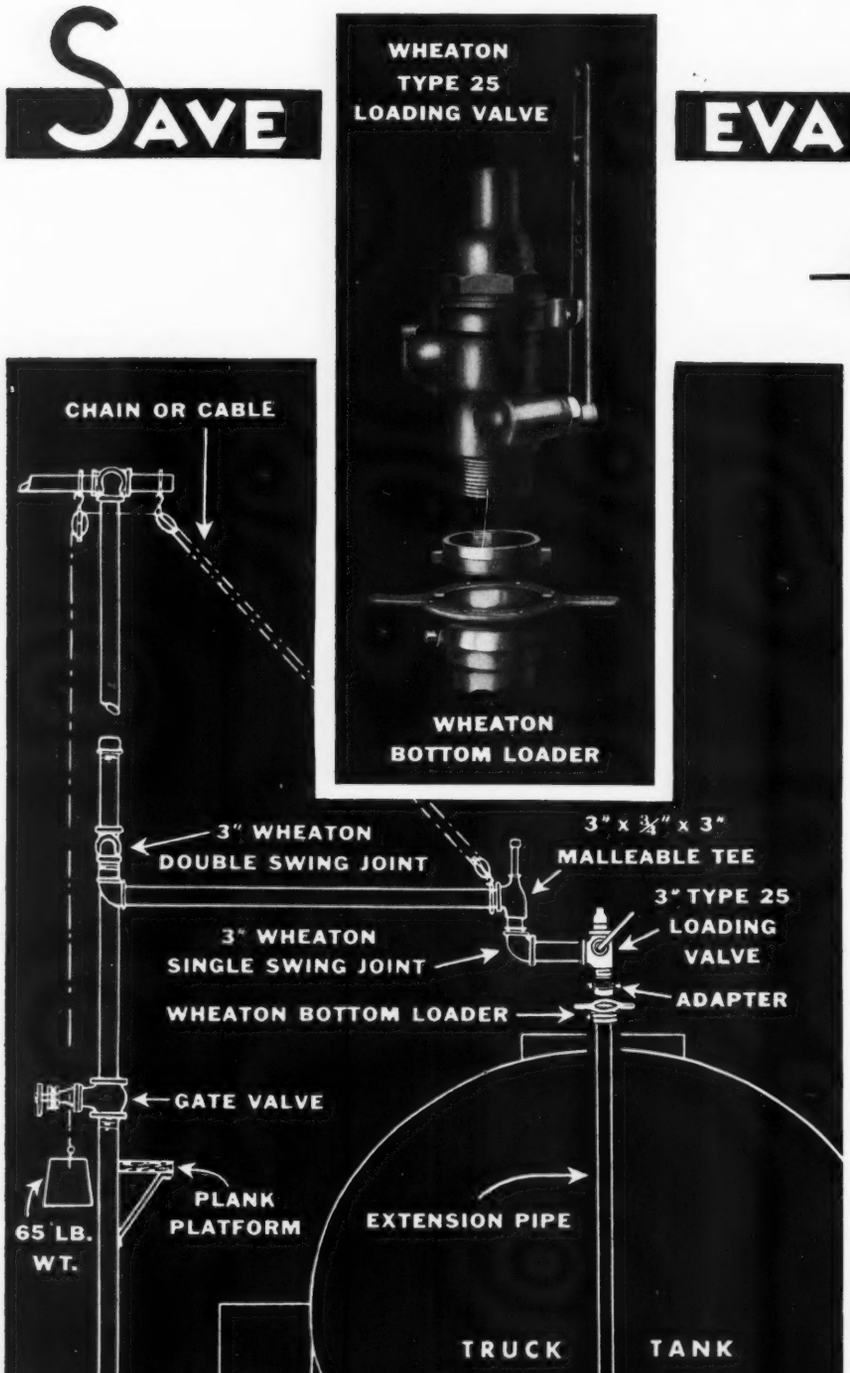
Proposed Specifications for Liquid Asphaltic Road Materials

	Material Type												
Test Requirements	SC-1	SC-2	SC-3	SC-4	MC-1	MC-2	MC-3	MC-4	MC-5	RC-1	RC-2	RC-3	RC-4
Water and Sediment, %	2.0—	2.0—	2.0—	2.0—	.....	.....	.....	.....	.....	.....	.....	.....	.....
Flash Point, F.	150+	200+	200+	250+	.....	150+	150+	150+	150+	80+	80+	80+	80+
Visc., Furol, @ 77 F.	20–150	.....	.....	.....	40–150	.....	.....	.....	.....	.....	.....	.....	.....
Visc. Furol, @ 122 F.	.....	200–320	.....	.....	.....	.....	.....	.....	.....	80–160	200–400	.....	.....
Visc. Furol, @ 140 F.	.....	.....	150–300	350–550	.....	150–250	300–500	500–800	.....	.....	.....	275–400	700–1400
Visc. Furol, @ 180 F.	.....	.....	.....	.....	.....	.....	.....	.....	17–280	.....	.....	.....	.....
% distilled to 374 F.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5+	.....	.....	.....
% distilled to 437 F.	.....	2—	2—	2—	10—	2—	2—	1—	1—	12+	10—	3—	0.5—
% distilled to 600 F.	.....	15—	10—	8—	25+	10–20	8–20	16—	14—	25+	20+	14+	7+
% distilled to 680 F.	50—	25—	20—	18—	50—	27—	25—	25—	20—	40—	35—	30—	25—
Float of residue, 122 F., secs.	50—	25+	25+	25+	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penetration, residue, 100 g., 5 sec. 77 F.	.....	.....	.....	.....	70–300	100–300	100–300	100–300	100–300	60–120	60–120	60–120	60–120
Ductility, residue, 77 F., cm.	.....	.....	.....	.....	60+	60+	60+	60+	60+	60+	60+	60+	60+
Solubility, residue, in CS2, %	99.0+	99.0+	99.0+	99.0+	99.5+	99.5+	99.5+	99.5+	99.5+	99.5+	99.5+	99.5+	99.5+
Recommended Uses.	Dust Layer	Aggregate, densely graded	Aggregate, densely graded	Aggregate densely graded	Primer	Aggregate, densely graded	Aggregate, densely graded	Aggregate, open graded	Aggregate, open graded	Surface treatments	Aggregate, open graded	Aggregate, coarse, open, and densely graded	Coarse Aggregate


Skyline of Tulsa,
Oil Metropolis
of the Mid-Continent
THE
MID-CONTINENT
A Four Billion Barrel
Oil Reserve

SAVE EVAPORATION

—load your trucks from the bottom



EVAPORATION losses can be prevented by filling truck tanks from the *bottom* up. A simple method of doing this is shown in the accompanying blue print.

You will observe an adapter, which screws onto the Wheaton Type 25 Loading Valve. Also, you will observe a Wheaton Bottom Loader, to which is attached an extension pipe of correct length to reach within an inch or two of the tank bottom. Connection is made in a fraction of a minute by simply slipping the Bottom Loader onto the adapter and giving it a part turn with the wing handles. That is all there is to it.

The use of the Wheaton Bottom Loader in loading truck tanks and tank cars prevents heavy loss of vapors which occur when tanks are loaded directly from the valve at the top of the tank.

The Wheaton Bottom Loader is made of *special-analysis bronze*—and fits and functions with that precision for which all Wheaton Products are noted. Samples sold on approval. Write for new booklet showing many other installations.

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Mechanical Products Corporation
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William A. Knapp Company,
Kansas City, Mo.

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Wheaton

FAUCETS - VALVES - JOINTS - COUPLINGS - FILLERS - NOZZLES - FITTINGS

Half of the United States Lies in Normal Marketing Territory *of the Mid-Continent*

By
Allen S. James
N. P. N. Staff Writer

An area approximately 48 per cent of the entire United States comprises the normal Mid-Continent trade territory, as shown on the map above. The territory is that shown within the heavy black line, with Mid-Continent refinery centers represented by the dots. (Map copyright by Rand McNally & Co., Chicago.)

FIFTY per cent of the motor vehicle registrations in the U. S. at the end of 1932 were in the so-called normal trade territory of Mid-Continent refiners.

Forty-nine per cent of the total gasoline consumption in the United States in 1932 was in that territory.

Fifty-two per cent of the total population of the U. S. is in those 21 states, which, incidentally, represent 47.7 per cent of the area of the country.

The population of that area is approximately 45 persons per square mile, as compared with approximately 41 persons per square mile for the entire U. S.

These figures indicate the size and importance, as a consuming market, of the territory in which refined products from the Mid-Continent are sold.

The geographical location of that trade territory is shown on the accompanying map, together with the refining centers in the Mid-Continent.

It will be seen that the territory just skirts the more sparsely populated western and northwestern states, takes in virtually all the big farming belt and the more densely populated industrial centers of the middle west, swings into the still more densely populated central U. S. and reaches far down into the southern and southeastern states.

Location of boundaries of this territory, as shown on the map, were determined primarily on the basis of freight rates from various freight rate groups in the Mid-Continent. At times Mid-Continent refiners find their more desirable market well saturated and, to keep production moving they hurdle these freight rate barriers for considerable distances.

For that reason statistics used in determining the percentages given previously were used for the entire 21 states, although it will be seen the boundary lines cut through four states on the east, swing through the center of Texas, and into New Mexico and Colorado and back into the Dakotas. No statistics, however, were used for either New Mexico or Colorado.

Gasoline consumption in the U. S. in 1932, according to tax reports and other sources of information, totaled 15,497,409,000 gallons. In the 21 states included in this Mid-Continent trade territory the gasoline consumption was 7,526,760,000 gallons. The total consumption for the remainder of the U. S., exclusive of this territory, was 7,970,649,000 gallons.

An average of 20,621,000 gallons of gasoline were consumed each day last year in this Mid-Continent normal trade territory. That is equal to 2578 tank cars daily of 8000 gallons capacity. The daily consumption for the entire U. S. was 42,459,000

W. T. Atkins, vice-president in charge of sales, Skelly Oil Co., Kansas City, Mo.

gallons or 5307 tank cars, while for the U. S. exclusive of the Mid-Continent trade territory, the total was 21,838,000 gallons, or 1,217,000 gallons more than that in the Mid-Continent's territory. That is a difference of 152 cars daily.

Not all of this gasoline consumed in this enormous trade territory came from Mid-Continent refineries. Refiners in adjacent districts obtained a good share of the business but the figures show conclusively the magnitude of the territory in which Mid-Continent refiners market their products day after day, and the market on which they must depend for a large portion of their distribution.

Total motor vehicle registrations at the close of 1932 is given as 24,373,979. This total includes buses, trucks and pleasure cars. The total for the 21 states was 12,338,725. That leaves 12,035,254 motor vehicles registered in the U. S. outside this territory, 303,471 less than within the Mid-Continent trade territory.

The total population of the U. S., according to government census figures for 1930, is 122,775,000, of which 64,135,000 are in the trade territory under discussion.

Gasoline, of course, is not the only product Mid-Continent refiners market in this territory. A major portion of their other refined products are distributed there, including virtually every product made from crude oil.

A number of refiners located in the Mid-Continent have their own marketing outlets in this territory but only a very few are so situated they can distribute all their production without the aid of the hundreds of independent marketers who are the backbone of refined petroleum distribution in this section of the U. S.

There probably are more independent marketers in this trade territory than in any other section of the country. There is scarcely a town or hamlet that does not have one or more independent marketers either living there or living nearby and serving that particular area.

These marketers, in some instances, have built up their business by handling the branded products of Mid-Continent refiners. Many have contracts with refiners for all their requirements. Others have built up a business under their own brands. In either case they are the major distributors of petroleum products for Mid-Continent refiners.

In virtually every state these independent marketers have their own state associations. Some of these are exceptionally strong and active, and count their memberships in the hundreds.

In some of the larger centers these independent marketers have organized associations in cities and communities.

In the farming belt particularly these independent marketers have a wide distribution. For example, there is an independent marketer in Kansas who has distribution over virtually the northwest quarter of that state. There are others who have equally as much distribution. Their sales are made not only through their own and contracted retail outlets but also in bulk to smaller independent marketers.

The accompanying map shows also the location of the refining centers in the Mid-Continent, which, in most instances, are in or adjacent to crude oil fields.

The group which centers on the Missouri Kansas line are plants located in or near Kansas City. The plants in the south central portion of Kansas are in and near the older producing fields of Kansas, while the plants in the central and west central area are the newer plants which have been built following the recent development in that district.

The refineries in Oklahoma are grouped well in the north central and northeastern area, with a few scattered in the central and south central area. The plants in the Texas Panhandle are grouped near Amarillo while those in north Texas are around Wichita Falls, Fort Worth and Dallas.

The East Texas field has caused a new refining district to spring up about half way between the Fort Worth-Dallas and the Shreveport-El Dorado groups, the latter being shown in south Arkansas and northwestern Louisiana.

Plants in southwest Texas are not listed as being in the Mid-Continent proper, since little of their products finds its way consistently into normal Mid-Continent marketing territory. The Gulf coast plants do not touch the Mid-Continent marketing area except in some portions of the southeast.

With this vast marketing territory, it might be assumed that the refining capacity of the Mid-Continent would be abreast of the consumption, but this is not true. Government figures a year ago listed the refining capacity of the Mid-Continent at about 21 per cent of the entire U. S. Yet this same marketing territory has 50 per cent of the cars of the U. S. and 52 per cent of its population.

Photo by Blank-Stoller, Inc.

L. B. McCammon, vice-president, Marathon Oil Co., Tulsa

An early day Oklahoma refinery. Cosden & Co. refinery at Bigheart, Okla. on the site of which now stands the modern plant of Barnsdall Refineries, Inc.

War's Demand Speeded Development of Mid-Continent *Refining Industry*

By
Lawrence E. Smith
N. P. N. Staff Writer

"THOSE were the days," said the Old Timer when we asked him to plumb his memory and recall the Mid-Continent refining situation of 15 years ago.

Maybe so. It was different, anyway. That puts us back into the early part of 1918. The war was on, the government was preparing for its mighty final push. The oil industry was mobilized for action.

There was federal regulation of an effective sort then. Strange that 15 years later the federal government should be moving in again and for an entirely different reason.

The columns of NATIONAL PETROLEUM NEWS of that day carried numerous items concerning this man or that who was leaving the oil business for military or naval service.

Tulsa was truly the center of the oil industry. Oklahoma was the big refining state for the reason that it was the chief supplier of crude oil. The independent refinery flourished and waxed fat. It was the beginning of an era of plant expansion.

Everybody came to Tulsa on any oil deal that was of any size. The lobby of the Hotel Tulsa was the place where every man who was anybody at all put himself on display nearly every night. The oil writers had desks in the lobby of that hotel and caught their news on the fly. Nearly every man who "worked" the lobby was his own executive committee and deals were made in a hurry.

Shreveport was something of an oil town, Wichita Falls, Tex., and Wichita, Kans., had some hold on the business. Dallas and Fort Worth had scarcely been exposed to petroleum as yet. But it was to Tulsa that the oil man turned his face as the Moslem bends toward Mecca.

Two trade association which still exist were functioning in the territory then, the Mid-Continent Oil & Gas Association and the Western Petroleum Refiners Association. There was then no American Petroleum Institute.

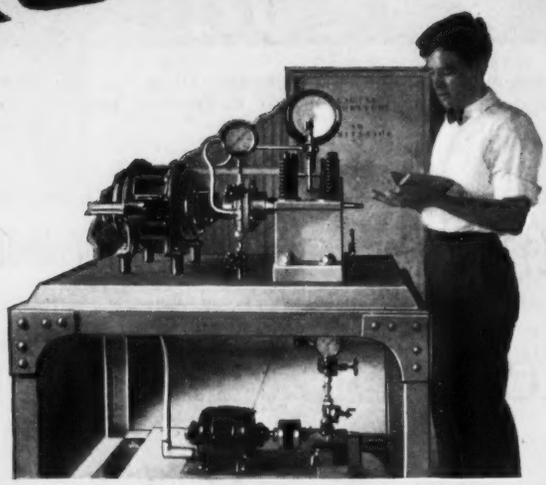
Crude oil at the beginning of 1918 was $3 per barrel in the Mid-Continent, regardless of gravity. Oklahoma gasoline was 17-18 cents and fuel oil was $2.40 to $2.60 per barrel. The gasoline tax hadn't been invented. "Casinghead" was being used to some extent to blend with kerosine. Nobody had heard of an octane rating and the Ethyl Gasoline Corp. couldn't have been much more than C. F. Kettering's idle dream if, indeed, he had thought of it at all. The old Model-T ran pretty well on whatever you gave it.

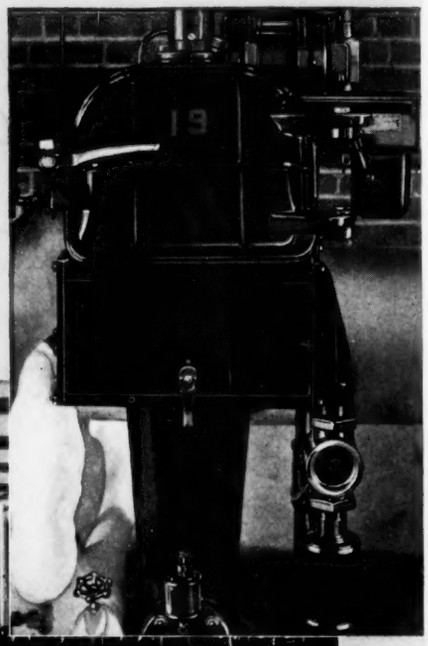
There was no gasoline tax, no "hot" oil, no proration. "Allocation" was being practiced, but not on production. It applied to equipment used in drilling. If the government decided a well wasn't essential to the winning of the war, it wasn't drilled.

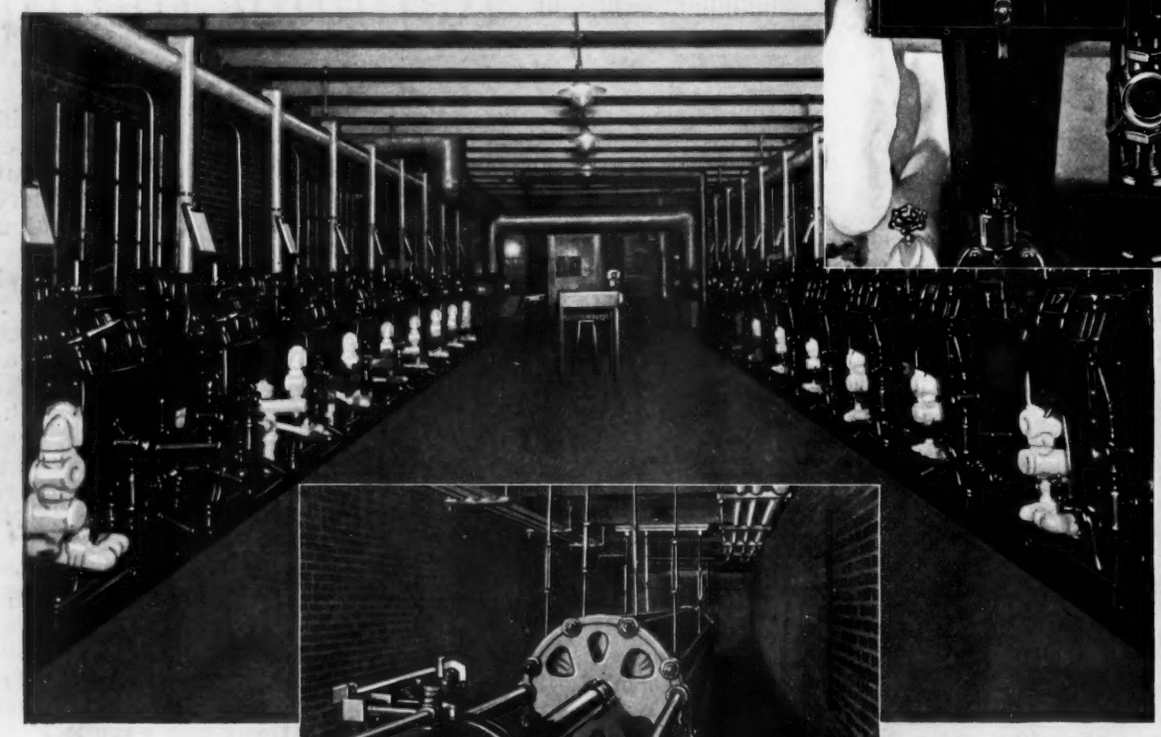
Military proration had't been

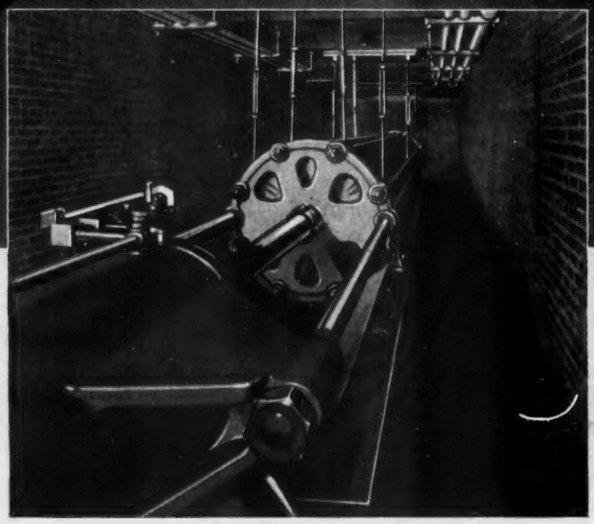
PROCESSING

ONE OIL 4 SEASONS









Top Picture: Deep Rock's Navy work test machines where oils are tested for wear

Right: One of the wax presses which removes wax from Deep Rock neutral oils, a contributing factor in the preference which prevails throughout the trade for Deep Rock blended oils and components

Upper Right: Close-up of one of the super-centrifuges

Above: A battery of super-centrifuges operating at 17,000 r.p.m. This special equipment removes all wax from Deep Rock bright stock at 40° to 60° below zero

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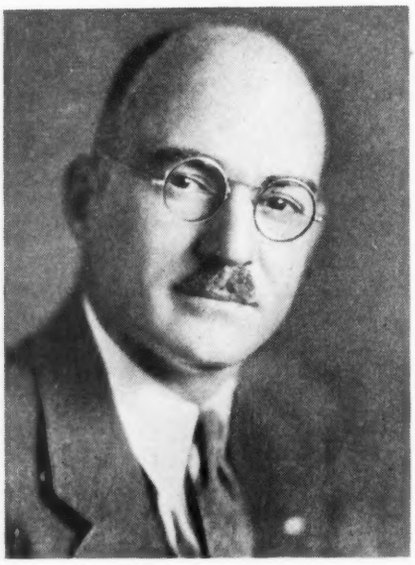


J. R. Battenfeld, president, Battenfeld Grease & Oil Corp., Kansas City, Mo.

invented and the "oil war" governors were busy at something else. R. S. Sterling, recent governor of Texas, was then president of the Humble Oil & Refining Co., at which the Standard Oil Co. of New Jersey was casting amorous glances. "Alfalfa Bill" Murray had said that he was through with Oklahoma forever and was launching a grandiose colonization scheme in Bolivia.

There were no gasoline pipelines and the Prairie Oil & Gas Co., monarch of the Mid-Continent scene, was the big buyer of oil. The Prairie Pipe Line Co. transported nearly all the crude that moved out of Oklahoma, Kansas and north Texas.

The Burkburnett and Ranger booms were yet to come. Any well more than 3500 feet deep was considered quite deep.

At that time a man named William G. Skelly had modest offices in the Kennedy Building, Tulsa. Today, he has a handsome 10-story building and his Skelly Oil Co. casts its shadow over a dozen states. Another big one of the Mid-Continent independents of today is the Phillips Petroleum Co. Fifteen years ago it was a producing company, capital $1,500,000. Now is occupies a large building in Bartlesville, is complete in all branches of the business.

The big independent refiner of the Mid-Continent when 1918 opened was Cosden & Co. J. S. Cosden owned the tallest office building in Tulsa. His old Cosden & Co. is now the Mid-Continent Petroleum Corp., its 40,000-barrel refinery still the biggest in Oklahoma. Jacob France, a vice president of Cosden in its latter days, is now president of its successor.

Through the years the casualties among refineries of 1918 have been heavy. Mergers, reorganizations, receiverships have taken large toll. Personnel has changed. Many have died, some have retired or have gone into other businesses. Plants have become obsolete and have been torn down, or their remains still clutter up the sites.

The list of refining companies in Oklahoma, Kansas, north

E. O. Derrick, sales manager, Cushing Refining & Gasoline Co., Cushing, Okla.

Texas and Louisiana is too lengthy to give here. We attempt to tell briefly the history of some of those which still are in operation, aided in this task by several persons who are still in the business.

The list begins with the Allied Refining Co., Tulsa, headed by E. L. Robinson, Tulsa, with W. R. "Pop" Stewart, of beloved memory, as vice-president. It had a 1500-barrel plant at Okmulgee. This was purchased by the Independent Oil & Gas Co., combined with the 4000-barrel plant of the Indiahoma Refining Co., then operated by the late E. E. Schock. Now, enlarged, rearranged and modernized they constitute the Okmulgee plant of the Phillips Petroleum Co. Mr. Robinson still lives in Tulsa, "Pop Stewart is dead.

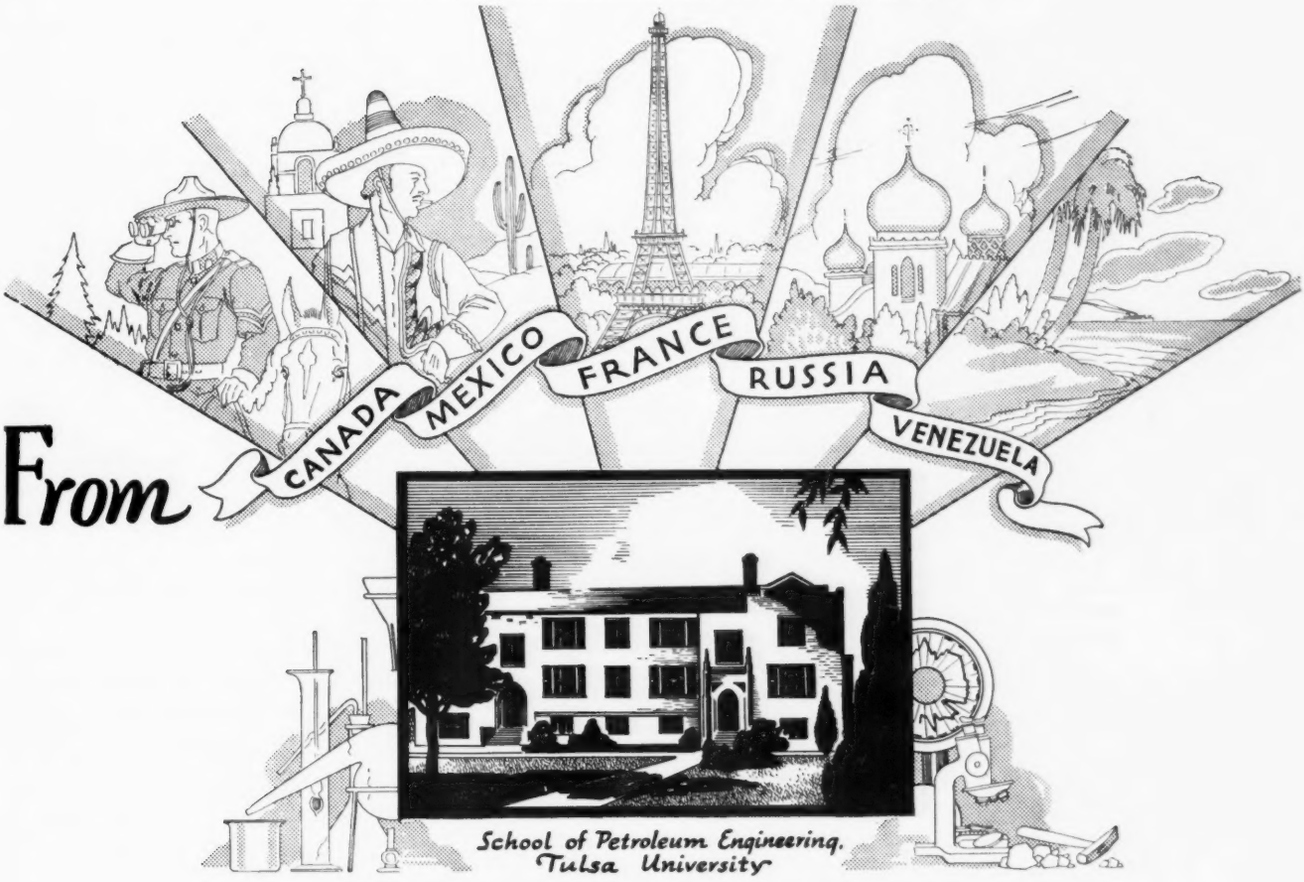
The Ardmore Refining Co., with a 5000-barrel plant at Ardmore, was headed by C. R. Armstrong, Lock Haven, Pa., but was a part of the International-Ardmore division of the Ohio Cities Gas Co., now the Pure Oil Co. W. B. Hassett was vice-president, general manager and treasurer. The Ohio Cities company shortly before 1918 had bought this plant from the Gunsberg & Forman interests. Later, Messrs. Armstrong and Hassett formed the Imperial Refining Co., plant at Ardmore, still later organized other refining companies. Mr. Armstrong lives in Lock Haven yet. Mr. Hassett lives in Clayton, Mo., near St. Louis, from where he directs a substantial group of retail marketing stations, and manages the Kettle Creek Refining Co., El Dorado, Ark.

The refinery at Bigheart, Okla., north of Tulsa, had been sold by J. S. Cosden to a group who formed the Bigheart Petroleum Refining Co. Stanley L. Smith was president and Earl G. Hastings was vice-president and general manager. The plant later was bought by the Barnsdall interests and the name of the town changed to Barnsdall. Mr. Hastings is now an officer of the Jones Oil Well Reamer Co., Tulsa.

F. B. Parriott, prominent in

C. L. Mayhall, vice-president in charge of sales, Anderson-Prichard Oil Corp., Oklahoma City

Second of a series of advertisements about Tulsa . . . Oil Capital of the World.



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'The establishment of a school of petroleum engineering was an important step in the consolidation of Tulsa's position as the Oil Capital of the World.

Photo by C. Bennett Moore
William H. Saunders, Jr., president, International Lubricants Corp., New Orleans

the industry for many years, was president of the Boynton Refining Co., with a refinery at Boynton. The company was controlled by the Riverside Western Oil Co., which, in 1920, went into the group of companies forming the Transcontinental Oil Co. The Transcontinental was acquired by the Ohio Oil Co. Its subsidiary, Marathon Oil Co., owns the Boynton plant, now shut down.

The Cameron Refining Co., Ardmore, was starting to build a plant at Ardmore as 1918 began. J. M. Cameron headed the company and Wirt Franklin was a vice-president. The plant went into the merger of several companies a few years ago creating the Wirt Franklin Petroleum Corp.

The Constantin Refining Co., Tulsa, was one of the big ones of the territory. The late E. Constantin was president and his son, E. Constantin, Jr., was vice-president. The refinery was in West Tulsa, of 12,000 barrels capacity. Nothing is left there now but a small brick building and an agitator. The son operates a small refinery in East Texas and has been prominent in litigation directed at the state's efforts to curtail East Texas production. His name has gone into legal history, as it was the "Constantin Case," which settled the question of the governor's right to use the national guard to handle proration.

The Consumers Refining Co., headed by C. B. Shaffer, Chicago, had a plant at Cushing. George N. Moore was general manager. This later became the Shaffer Oil & Refining Co. and more recently the Deep Rock Oil Corp. Mr. Moore's recent association has been with J. S. Cosden. Late in March Cosden bid in the properties of Cosden Oil Co. at receiver's sale. Mr. Moore served as special master in the receivership.

Crystal White Refining Co.'s 1000-barrel refinery at Allen, Okla., in time came to be the White Oak Refining Co. and is now owned by the Associated Petroleum Corp. There was the Danciger Oil & Refining Co., of Kansas City, owning a small refinery at Drumright. Dan Danciger headed the company, as he still does. The Drumright plant is gone but the company has plants in Texas.

Empire Refineries, Inc., was becoming one of the major units. It operated, under one management but different names, two plants at Cushing, one each in Ponca City, Okmulgee, Oklahoma City, Gainesville, Tex., and Independence, Kans. Today, the Oklahoma City and Cushing plants have vanished, but the others, enlarged and modern, are operating. In addition, there is now a refinery at East Chicago. In 1918 the late J. C. McDowell was president of Empire Refineries, Inc., the late Frank W. Frueauff was vice-president; A. J. Diescher and H. R. Straight were vice-presidents. Mr. Straight is the only one of the four still identified with the company. P. M. Miskell, now general manager of these refineries, was not then named in the management.

Rex H. Winget, vice-president in charge of refinery operations, Cushing Refining & Gasoline Co., Cushing, Okla.

Underwood & Underwood Studios
Harry J. Kennedy, general sales manager, Continental Oil Co., Ponca City, Okla.

H. H. Champlin, banker and business man of Enid, had founded the Enid Refining Co. and was operating a 1000-barrel refinery. D. E. Bolene was superintendent. The latter went into business for himself later as the Bolene Refining Co., whose plant is now part of the Eason Oil Co. In place of the 1918 plant there is now a 16,000-barrel complete refinery, part of the extensive holdings of the Champlin Refining Co.

Globe Oil & Refining Co. had been organized by the man who still heads this company, I. A. O'Shaugnessy, and was building a refinery at Enid. Its present operations embrace refineries at Blackwell, Okla., McPherson, Kans. and Lemont, Ill.

The Illinois Oil Co., of which F. P. Welch was president and general manager, had a refinery at Cushing then. It is now shut down, but operated up to a year or so ago. . . . The Imperial Refining Co. at Ardmore was then headed by R. S. Quinby, Lock Haven, Pa. and had a 2000-barrel skimming plant. W. B. Hassett, previously mentioned, later took over the management of this company.

Marland Refining Co. then

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T. M. Martin, sales manager, Lion Oil Refining Co., El Dorado, Ark.

J. A. Vickers, president, Vickers Petroleum Co., Wichita, Kan.

had capital of $2,500,000 and a small plant at Ponca City. E. W. Marland, then president, is now a member of Congress; W. H. McFadden, vice-president, is still active in the oil business. Through merger this is now the Continental Oil Co. Its president Dan J. Moran, calls Ponca City, as well as New York, his headquarters.

The Muskogee Refining Co., a subsidiary of the Oklahoma Producing & Refining Corp., had a 3000-barrel plant at Muskogee. John M. Crawford, better known as a supply than an oil man—he still heads the Parkersburg Rig & Reel Co.—was president. This passed, with other assets of the Oklahoma P. & R., to the Pure Oil Co.

Pierce Oil Corp. was then headed by H. Clay Pierce and had a 10,000-barrel refinery at Sand Springs. This is now owned and operated by Sinclair Refining Co. . . . Producers & Refiners Corp. had shortly before acquired the Economy Oil & Refining Co. plant at Blackwell, Okla. Frank E. Kistler, now board chairman of the Oklahoma Natural Gas Corp., was president of the P. & R. The latter is in receivership, with the Consolidated Oil Corp. its principal creditor. The Blackwell refinery is idle.

Roxana Petroleum Corp., now Shell Petroleum Corp., was then headed by W. A. J. M. van Waterschoot van der Gracht, who now lives in Europe. Richard Airey was vice-president and T. F. Lydon was secretary. Both still are active in the oil industry, Mr. Airey in New York, as manager of the Asiatic Petroleum Co. and Mr. Lydon in St. Louis as vice-president of the Shell Petroleum. In 1918 the company had refineries at Cushing and Wood River, Ill. The Cushing plant was succeeded by one at Arkansas City.

Sapulpa Refining Co. was an active institution of its day. It had a 3500-barrel skimming plant at Sapulpa. Henry M. Rathvon was in charge and Leon N. Oppenheimer was secretary-treasurer. The company was finally bought by Continental Oil Co. prior to the merger with Marland Oil and the refinery was operated up to less than a year ago. The last we heard of Mr. Rathvon, he was in Montana.

Sinclair Refining Co. then operated the Coffeyville, Kans., plant which is today its key refinery for the Mid-Continent and in addition operated plants at Chanute, Kans., Vinita, Cushing and Muskogee, Okla., all now dismantled. Its refineries at Kansas City and East Chicago were nearing completion.

Sun Oil Co. then, as now, operated a refinery at Yale, Okla. . . . The Texas Co. plant at West Tulsa had capacity of 10,000 barrels. . . . Humble Oil & Refining Co. had invaded Oklahoma territory as a refiner and was the owner of a half interest in the Wilson Refining Co., New Wilson, Okla. William A. Rogers was president. This plant died some years ago and about six years ago the Humble completed its withdrawal across the Red River by selling its southern Oklahoma production to the Carter Oil Co.

The Tiger Refining Co. was building a 1000-barrel refinery at Okmulgee. After some vicissitudes, this refinery finally became part of the Waite Phillips Oil & Gas Co. and was in the big sale of Phillips properties eight years ago to Blair & Co., thence to the Barnsdall Corp. The old Tiger plant, rebuilt, enlarged and modern, is the Okmulgee plant of Barnsdall Refineries, Inc.

Yale Oil Corp., headed by L. B. Hancock, had a small refinery at Yale, Okla. and this plant has pegged away all through the years.

The foregoing calls the roll of Oklahoma refineries as of the beginning of 1918 which are still in existence. At the same time, Kansas was important in manufacturing. It was second to Oklahoma in number of plants, though ranking below Texas in capacity. In the latter state the refining industry capacity was largely concentrated on the Gulf Coast. The big fields of North Texas were not yet found.

J. J. Taxman was then president of the El Dorado Refining Co. and E. H. Johnson was sales manager. The refinery had capacity of 1000 barrels. Ownership and management changed some years ago, the refinery greatly enlarged, is among the substantial ones of Kansas today.

Evans-Thwing Refining Co., refineries at Wichita and Kansas City, were outstanding among the independents of the day. H. M. Evans, president, and F. H. Thwing, vice-president and general manager. These plants really were one, for the 3000-barrel refinery at Wichita never was operated, was moved to Kansas City. It was dismantled years ago. This firm had an interesting part in the development of Mid-Continent refining. Its first plant was at Ponca City. Later it built refineries at Cushing and at Gainesville, Tex. All three

were sold to the Doherty interests and those at Ponca City and Gainesville are going strong under the Empire Oil & Refining Co. banner. Inquiries concerning Mr. Evans brought us no information, but Mr. Thwing still lives in Kansas City. He has played no active part in the oil business for several years. A member of that organization in its early day was Palmer Hughes, who was in charge of sales. He now lives in Tulsa, is district manager for the M. W. Kellogg Co.

Golden Rule Refining Co. had a refinery at Wichita, 1000 barrels capacity. Elbert S. Rule was president then and is now. Hutchinson Refining Co., headed by F. O. Larabee, better known as a flour miller, had a small plant. This recently was restored to operation after years of idleness by several producing companies who formed the Sunflower Oil Refining Co. . . . The Kanotex Refining Co., then headed by the late John McE. Ames, was in business at Arkansas City. C. M. Boggs, who has been president for several years, did not appear in the management personnel in 1918.

Harry W. Jones, as president, and Albert R. Jones, vice-president, with E. W. Goebel, general manager and treasurer, constituted the management of the Kansas City Refining Co. Its refinery, near Kansas City, successively became the plant of the Manhatten Oil Co., then was acquired by the Independent Oil & Gas Co. and today operates as the Kansas City plant of the Phillips Petroleum Co. The Jones brothers lived in Independence. A third brother, Roy B. Jones had gone to Wichita Falls and joined in organizing the Panhandle Refining Co., which he heads today. Mr. Goebel is still in the oil business, is active in the management of the Westgate Oil Co., a substantial producer in the Oklahoma City field.

William G. Skelly in those days was president of the Midland Refining Co. It went into the formation of the Skelly Oil Co. in 1919. National Refining Co., of Cleveland, O., operated one of the larger refineries of Kansas, as it still does. Its Coffeyville plant then had 4000-barrel capacity and F. B. Fretter, of Cleveland, now president, was first vice-president. . . . The pioneer refinery of Kansas, Standard Oil Co. of Kansas, Neodesha, had capacity of 8000 barrels and the company was headed by the late J. C. McDonald. This refinery became the property of the Standard Oil Co. of Indiana in 1932.

White Eagle Petroleum Co. had been organized by L. L. Marcell, who was president, the late J. H. Miller, vice-president and general manager, and F. L. Miller, secretary. The latter two at a little later date were refiners under the name of the Miller Petroleum Co. The White Eagle, with modifications in name, is today a subsidiary of the Socony-Vacuum Corp., still is headed by Mr. Marcell, now chairman of the board, and still operates the refinery at Augusta, Kans., which in 1918 was a 5000-barrel plant.

In the War era of which we write, north Louisiana was more of a refining district than was north Texas. The reason was, of course, supply of crude oil. . . . Caddo Oil & Refining Co. was headed by G. W. Kendrick, 3rd, with E. K. Smith and J. B. Atkins as vice-presidents. Its Shreveport plant and other properties went into the Shreveport Producing & Refining Corp., now the Spartan Refining Co. . . . Louisiana Oil Refining Corp., now controlled by Cities Service, had a 3000-barrel refinery near Shreveport. E. R. Ratcliff was president and J. B. Shearer was vice-president. Mr. Ratcliff is now head of the Spartan.

North Texas was content to get most of its gasoline and oils from other areas, as the crude oil supply was lacking to bring refineries into the region. Magnolia Petroleum Co. was then headed by John Sealy and E. R. Brown, who recently was made chairman after many years' service as president, was vice-president. It had then, as now, refineries at Fort Worth, Beaumont and Corsicana, but of capacities less than half of what they are today.

W. R. Smith was then president of the Oriental Oil Co., Dallas, and continues in that capacity now. The company's refinery was at Dallas.

Roy B. Jones, well known to all oil men the country over, was then general manager of the Panhandle Refining Co., which had a 3500-barrel refinery at Wichita Falls. This is one that has continued through the years. Mr. Jones has been the company's president for some years.

Pierce Fordyce Oil Association, of which H. Clay Pierce was chairman, had an operating plant at Fort Worth. This has been shut down for years, is now owned by Consolidated Oil Corp.

A list of the active plants in Mid-Continent proper follows:

Active Refineries in the Mid-Continent

Arkansas

Company	Location Plant	Crude Capacity	Cracking Capacity	Type Refinery
Berry Asphalt Co.	Waterloo	1,500	.....	A & L
Cross Co., Henry H	Smackover	4,500	.....	S
Houston Oil Co. (Tex.)	Camden	3,000	1,500	Cr
Kettle Creek Ref. Co.	El Dorado	3,200	1,400	S
Lion Oil Ref. Co.	El Dorado	12,000	4,500	A, Cr & S
McMillan Pet. Co.	Norphlet	2,000	.....	L
Ouachita Valley Ref.	El Dorado	2,000	800	S
Root Ref. Co.	El Dorado	12,000	5,000	Cr & S
Simms Oil Co.	Smackover	3,000	2,200	C & Cr
	Totals	43,200	15,400	

(List Continued on page 61)

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Active Refineries in Mid-Continent (Continued from page 56)

Kansas

Company	Location Plant	Crude Capacity	Cracking Capacity	Type Refinery
Altitude Pet. Corp.	Chanute	6,000	1,500	C & Cr
Barnsdall Ref., Inc.	Wichita	5,000	1,500	Cr & S
Darby-Slick	Hutchinson	3,000	.....	S
Derby Oil & Ref. Corp.	Wichita	9,000	2,500	A Cr & S
Dickey Oil Co.	McPherson	3,000	3,000	Cr & S
Eldorado Ref. Co.	Eldorado	5,000	2,500	Cr & S
Globe Oil & Ref. Co.	McPherson	10,000	10,000	Cr & S
Golden Rule Ref. Co.	Wichita	1,000	1,200	Cr & S
Kanotex Ref. Co.	Arkansas City	12,000	6,000	Cr & S
National Ref. Co.	Coffeyville	8,000	3,000	C & Cr
Phillips Pet. Co.	Kansas City	10,000	2,500	Cr
Shell Pet. Corp.	Arkansas City	22,000	10,000	Cr & T
Sinclair Ref. Co.	Coffeyville	12,000	13,000	Cr L & S
Sinclair Ref. Co.	Kansas City	11,000	13,000	Cr & S
Skelly Oil Co.	Eldorado	23,000	18,000	A Cr & S
Standard Oil, Ind	Neodesha	8,000	6,400	Cr
Vickers Pet. Co.	Potwin	3,500	1,500	Cr & S
White Eagle Oil Corp.	Augusta	16,000	16,000	A Cr & S
	Totals	167,500	111,600	

Louisiana

Bayou State Ref. Corp.	Houston	800	800	L
Cedar Grove Ref. Co.	Shreveport	1,500	.....	S
Chalmette Pet. Corp.	Chalmette	10,000	3,000	Cr S & T
La. Oil Ref. Corp.	Bossier City	15,000	15,000	Cr.
Mexican Pet. Corp.	Destrahan	20,000	....	A & S
Shell Pet. Corp.	Norco	16,000	8,000	A Cr & T
Sinclair Refining Co., La	Mereaux	30,000	30,000	A
Spartan Ref. Co.	Shreveport	10,000	7,500	S
Standard Oil, La.	Baton Rouge	100,000	100,000	Cr & S
Stanolind Oil & Gas Co.	Superior	5,000	2,200	Cr & T
The Texas Co.	Shreveport	6,500	.....	T
	Totals	214,800	153,000	

Oklahoma

Altitude Pet. Corp.	Oklahoma City	3,000	.....	S
Anderson-Prichard Ref.	Cyril	6,000	3,500	Cr & S
Associated Pet. Corp.	Allen	6,500	1,250	S & T
Barnsdall Refineries Inc.	Barnsdall	5,000	4,000	C
Barnsdall Refineries Inc.	Okmulgee	11,000	4,500	Cr & S
Beckett Corp., The	Beckett	1,500	1,500	Cr
Bell Oil & Gas Co.	Grandfield	3,000	1,300	Cr & S
Bilmont Ref. Co.	Garber	1,000	1,000	Cr
Black Gold Ref. Co.	Oklahoma City	1,500	.....	
Capital City P & R Co.	Oklahoma City	3,500	.....	
Champlin Ref. Co.	Enid	16,000	2,000	C
Continental Oil Co.	Ponca City	30,000	9,000	C Cr S
Continental Oil Co.	Sapulpa	4,000	1,500	Cr & S
Cushing Ref. Co.	Blackwell	1,500	.....	
Cushing Ref. Co.	Cushing	4,500	.....	
Deep Rock Oil Corp.	Cushing	12,000	4,000	L & S
Eason Oil Co.	Enid	5,000	1,500	Cr & S
Empire O & R Co.	Okmulgee	4,000	1,000	C & Cr
Empire O & R Co.	Cushing	5,000	.....	S
Franklin Oil Corp., Wirt	Ardmore	4,000	.....	S
Garber Ref., Inc.	Garber	4,500	2,200	Cr & S
Globe Oil Ref. Co.	Blackwell	8,000	3,000	Cr
Gulf States Corp.	Oklahoma City	4,500	.....	
Johnson Oil Ref. Co.	Cleveland	6,000	2,000	Cr & S
Knox Co., Chas. E.	Covington	200	.....	S
Marathon Oil Co.	Boynton	2,500	.....	C
Marathon Oil Co.	Bristow	5,000	.....	S
Mid-Continent Pet. Corp.	W. Tulsa	40,000	.....	C
Miller Bros.	Marland	100	.....	S
Peppers Gasoline Co.	Covington	1,000	.....	S
Phillips Pet. Co.	Okmulgee	6,000	2,500	Cr & L
Producers & Refiners Corp.	Tulsa	6,000	2,000	Cr & S
Producers & Refiners Corp.	Blackwell	3,000	.....	S
Producers Oil Corp.	Bristow	2,000	.....	S
Pure Oil Co.	Ardmore	2,500	2,400	Cr & T
Pure Oil Co.	Muskogee	8,000	5,000	C Cr & T
Rock Island Ref. Co.	Beckett	5,000	3,000	Cr & S
Sinclair Ref. Co.	Sand Springs	8,000	4,000	Cr L & S
Sterling Ref. Co.	Okla. City	2,500	.....	T
Sun Oil Co.	Yale	5,000	.....	L & S
The Texas Co.	W. Tulsa	14,000	18,500	C & Cr
Texas Pacific Coal & Oil Co.	Wynnewood	3,000	.....	A & T
Tidal Ref. Co.	Drumright	18,000	8,000	Cr & S
Western Oil Corp.	Beckett	2,000	.....	S
Wilcox Oil & Gas Co.	Bristow	5,000	1,500	Cr & S

(Continued on page 62)

Active Refineries in Mid-Continent (Continued from page 61)

Company	Location Plant	Crude Capacity	Cracking Capacity	Type Refinery
Yale Oil Corp.	Yale	2,000	.....	S
York Ref. Co.	Okla. City	2,000	2,000	S
	Totals	293,800	92,150	
	N. & Central Texas			
All-State Ref. Co.	Thrall	2,500	.....	S
Atlantic, Pacific & G.	Wichita Falls	5,000	5,000	C, Cr & S
Archer Ref. Co.	Megargel	1,500	.....	S
Continental Oil Co.	Wichita Falls	5,000	2,300	Cr & S
Dale Oil & Ref. Co.	Electra	4,000	.....	S
Danciger Oil & Ref. Co.	Pampa	7,000	.....	S
Dixon Creek O. & R. Co.	Kings Mill	5,000	.....	S
Empire O. & Ref. Co.	Gainesville	5,000	2,000	Cr & S
Falls Ref. Co.	Wichita Falls	2,000	.....	S
Foster & Co.	Denison	500	.....	L & S
Gulf Ref. Co.	Ft. Worth	6,000	3,000	Cr & T
Humble Oil & Ref. Co.	Neches	5,000	.....	T
Humble Oil & Ref. Co.	Breckenridge	1,500	.....	T
Humble Oil & Ref. Co.	Chilton	4,500	.....	T
Jacob O. & G. Co.	Graham	100	.....	S & T
Magnolia Pet. Co.	Corsicana	4,000	.....	S
Magnolia Pet. Co.	Ft. Worth No. 1	4,500	3,000	Cr & S
Magnolia Pet. Co.	Ft. Worth No. 2	2,600	750	Cr & S
Magnolia Pet. Co.	Magpetco	10,000	.....	A & T
Marathon Oil Co.	Ft. Worth	5,000	.....	C
Master Pet. Co.	Waco	750	.....	S
Mid-Texas Pet. Corp.	Eliasville	1,000	.....	S
Octane Oil Ref. Co.	Baird	1,400	1,400	Cr
Oriental Oil Co.	Dallas	2,000	1,200	Cr
Panhandle Ref. Co.	Wichita Falls	5,000	1,500	Cr & S
Phillips Pet. Co.	Borger	25,000	10,000	T
Phoenix Ref. Co., Inc.	Dallas	1,000	.....	S
Pilot Point Ref. Co.	Pilot Point	500	.....	S
Simms Oil Co.	W. Dallas	4,000	2,500	C & Cr
Sinclair Ref. Co.	Ft. Worth	4,000	.....	S
Star Ref. & Prod. Co.	Ft. Worth	1,500	600	Cr
Taxman Ref. Co., Inc.	Wichita Falls	3,500	.....	S
The Texas Co.	Amarillo	4,000	3,450	C & Cr
The Texas Co.	W. Dallas	16,000	9,200	C & Cr
Texas Pacific C. & O. Co.	Caddo	1,000	.....	T
Texas Pacific C. & O. Co.	Ft. Worth	3,000	1,000	Cr L & T
Waggoner Ref. Co.	Electra	3,500	.....	S
White Star Ref. Co.	Cisco	500	.....	L & S
Wilcox O & G Co.	Pampa	3,000	.....	S
	Totals	161,350	46,900	
	East Texas			
Alamo Ref. Co.	Camp Switch	2,500	.....	S
Arp Ref. Co.	Arp	1,000	.....	S
Arrow Ref. Co.	Overton	2,500	.....	S
Beacon Oil & Ref. Co.	Henderson	2,500	.....	S
Central Ref. Co.	Friar	7,500	.....	S
Constantin Ref. Co.	Overton	2,500	.....	S
Cook Ref. Co.	Gladewater	1,000	.....	S
Danciger Oil & Ref. Co.	Longview	10,000	.....	S
Rusk Ref. Co.	Overton	3,000	1,000	S & C
East Texas Ref. Co.	Henderson	6,000	.....	S
East Texas Ref. Co.	Longview	10,000	2,000	Cr & S
Gasco Ref. Co.	Longview	250	.....	S
Gillen, John	Gladewater	250	.....	S
Gladtex Ref. Co.	Gladewater	500	.....	S
Gladewater Ref. Co., Inc.	Gladewater	750	.....	S
Gregg Ref. Co.	Gladewater	300	.....	S
Hyland Ref. Co.	Reed Switch	1,000	.....	S
Johnsonville Ref. Co.	Omega	250	.....	S
Kilgore Ref. Co.	Kilgore	2,000	.....	S
Lake Ref. Co.	Gladewater	250	.....	S
Locke Ref. Co.	Gladewater	550	.....	S
Nacogdoches Ref. Co.	Nacogdoches	150	.....	L
Overton Ref. Co., Inc.	Overton	3,500	.....	S
Panama Ref. Co.	Kilgore	250	.....	S
Pennant Ref. Co.	Kilgore	400	.....	S
Roland Ref. Co.	Arp	250	.....	S
Rusk Ref. Co.	Overton	900	.....	S
Sabine Ref. Co.	Gladewater	300	.....	S
Shoreline Ref. Co.	Kilgore	300	.....	S
Sinclair Ref. Co.	Kilgore	1,500	.....	S
Southern Oil & Ref. Co.	Reeds	3,500	.....	S
Taylor Ref. Co.	Taylor	5,000	3,000	Cr & S
Taylor Ref. Co.	Tyler	15,000	10,000	Cr & S
Trinity Ref. Co.	Gladewater	250	.....	S
Unit Ref. Co.	Kilgore	250	.....	S
V. O. E. Ref. Co.	Gladewater	1,000	.....	S
	Totals	87,150	16,000	

Mid-Continent Crude Oil Reserves

Total Four Billion Barrels

By Lawrence E. Smith
N. P. N. Staff Writer

TULSA, May

BACK of the giant refining industry of the Mid-Continent is an army engaged in supplying its raw material. The army numbers 50,000 or more, engaged in leasing, geological work, development, production and pipelining.

The result of their labors, over the many years that have passed since oil was found in Kansas in 1882, has been the establishment of a reserve of approximately four billion barrels in Kansas, Oklahoma, the Panhandle, north, west and east central areas of Texas, north Louisiana and Arkansas.

West Texas and the Gulf Coastal areas, not being tributary to the Mid-Continent refining territory, are not counted in arriving at this figure.

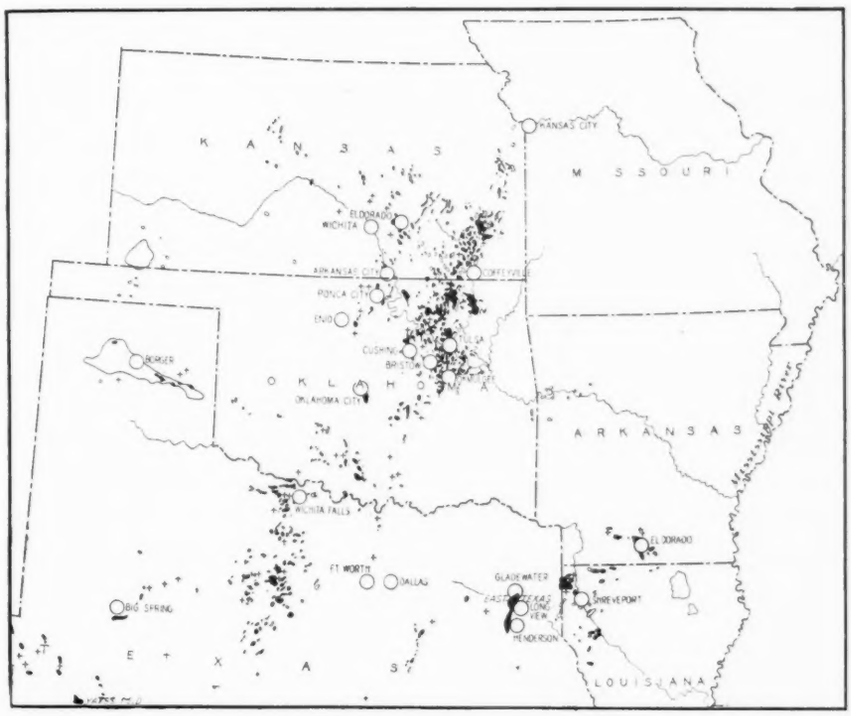
In setting down, baldly, a round, neat sum like four billion barrels, one hastens to supply certain qualifications. East Texas goes into the calculations with 1,800,000,000 barrels. That is oil to be recovered there. Under present wasteful methods of producing, however, its ultimate output will fall far below this figure. Recovery of that amount of oil depends upon inauguration of a plan of withdrawal that is orderly and certain to take full advantage of the natural water-drive that is advancing along the western front of the field. Whether such program will be adopted and carried out is uncertain.

Price will play an important part in the recovery of the huge reserve of the area tributary to the Mid-Continent refining industry. A half-barrel well is worth saving at a realization of $1.50, but it can't hang on long at 50 cents per barrel. Many hundreds of such wells in this territory have been abandoned and plugged in the past two years.

The beginnings of this great producing industry properly date from 1889, when first commercial production was found east of Paola. Prior to this, exploration had been conducted in several counties and natural gas found in paying quantity as early as 1886. In 1892, with the formation of the Standard Oil Co. of Kansas, the region's first refinery was built at Neodesha.

Shortly after that, part of Oklahoma then organized as Indian Territory began to be part of the oil industry. Exploration at widely scattered places was carried on and good showings were found, but not until 1897 was the well generally regarded as the first commercial producer drilled. This was in what is now the city park at Bartlesville and it is still producing.

Texas' petroleum history dates from 1889, disregarding



Oil and Gas map of the Mid-Continent states showing the relative position of the various refining districts to the producing fields. Major refining districts with two or more refineries are shown in circles while the locations of single refining units are indicated by crosses

A NEW WAY

FOR MARKETING AND ADVERTISING EXECUTIVES TO DO THE JOB

REFINERS are fast discovering that Mail Advertising, expertly planned and efficiently carried through, is perhaps their most effective advertising medium for developing contract inquiries and cementing jobber relations in any given territory « « In building such mail campaigns and sales promotional material, McCormick-Armstrong has been outstandingly successful because of its specialized experience, its "oil-minded" personnel and its constant contact with the industry. Since the opening of the Mid-Continent Field, this organization has devoted itself to the planning, creating and producing of mail campaigns and sales promotional material for every phase of marketing operations « « This record of service to many prominent Mid-Continent refiners has been set down in a booklet, "Marketing by Mail." This literature explaining how marketers have used mail advertising effectively will be mailed to any executive of the industry—without obligation, of course. Send for your copy.

McCORMICK-ARMSTRONG CO.
WICHITA, KANSAS

the various interesting but nonlucrative showings. The 1889 productive history was not imposing, as less than 50 barrels were marketed. The oil came from Nacogdoches county, in the east-central part of the state and about 50 miles southeast of the present East Texas field.

This field never produced much oil and the first consequential pool found was at Corsicana in 1896. Shortly afterwards, the first refinery in the state was built, by the predecessor of the Magnolia Petroleum Co.

Since those beginnings there have occurred the openings of a long list of pools—too many to set forth in detail here.

The speedy development of shallow sand production over a dozen counties in southeastern Kansas in the late '90s and a half dozen in northeastern Oklahoma during the same time afforded not enough room to the hundreds who were getting into the industry. Drilling spread over other territory, westward in Kansas, south and west in Oklahoma, it invaded north Texas and north Louisiana. Gusher pools came and went, each a "menace" of its day.

The industry withstood repeated shocks: Cushing, El Dorado, Ranger, Burkburnett, Mexia and its neighbor faultline pools, El Dorado, Ark., Smackover, Burbank, Tonkawa, Homer, Haynesville, Seminole, Oklahoma City, the Van field and finally East Texas. There was a host of smaller ones, all figuring importantly in its day.

Each left behind, after the development fury was spent and the army of drillers advanced to the next objective, a settled reserve which goes into the round figure of four billion barrels yet to be produced—at a price—from the territory under discussion. Such settled pools account for nearly half of that huge estimate.

Oil producing formations throughout this area range in age from the oldest to produce anywhere in the world, as in the Oklahoma City field, to nearly the youngest, as in north Louisiana and Arkansas. They yield many varieties of crude, "sweet" and sulfur, paraffin and asphaltic bases.

Bernard L. Majewski, ancillary receiver, Deep Rock Oil Corp., Chicago

Some take high rank as sources of lubricants, as is the case with nearly all of the shallow sand production of the old areas in northeastern Oklahoma and southeastern Kansas, the Burbank field of Osage county, Oklahoma City, Ranger, Texas. Others are valued principally for their gasoline yield.

An excellent retort here would be that they are not "valued" at all nowadays. To which the rebuttal reply is that all of the "menaces" previously enumerated were industry wreckers in their day; but they have passed into the form of settled reserves, just as Oklahoma City and East Texas will do.

The four-billion barrel reserve in the area under discussion will supply the requirements at the present rate of refining for eight to 10 years. It cannot all be recovered in that time, of course, nor in double that time. New pools will be found, though probably at much slower rate than characterized the period from 1926-1930, when Seminole, all the West Texas, East Texas, Oklahoma City, Hobbs and Van discoveries were so closely bunched as to bring on the plethora of crude and constantly falling price, far out of proportion to depression era prices in other industries.

The refining industry followed closely on the heels of the producers when the Mid-Continent area was opened. Utilization of the oil was at first local but, once the supply was assured, pipelines were laid to reach the distant markets. Oklahoma and Kansas crudes went to the Atlantic seaboard and south to the Gulf Coastal plants.

Both movements virtually ceased, with the finding of prolific fields in Texas to supply the coastal plants and to reach the Atlantic refineries by tanker. Oklahoma and Kansas crudes now find their markets in those states and in the Kansas City, Chicago, St. Louis and Ohio plants. A small amount goes as far as Pittsburgh.

The volume which reaches the Gulf Coast is small and confined generally to lubricating base crudes. East Texas and West Texas oils have nearly displaced everything else at Gulf Coastal plants and in plants of the Atlantic coast (foreign crude also playing a part in the scheme of manufacturing of the latter group)

In the movement of crude to refineries most of the independent refineries depend upon their own facilities, in marked contrast to the Appalachian region plants, where a few common carrier lines function to supply the entire group, augmented now and then by local gathering systems.

Thus we find many an independent plant with a pipeline system extending far beyond the nearby fields, which originally supplied all the crude for that plant, although those surrounding fields may still be adequate to care for the entire requirements of the plants of the region. Competition in buying from major purchasers divides the supply, compelling the smaller purchaser to enter new areas from time to time. The interest of but few refiners in the region is confined to a single field or nearby area.

Pipelines form a veritable network over the eastern half of Kansas, more than half of Oklahoma and cover thoroughly nearly all of Texas. The production of Arkansas is fairly well cared for by refineries within the state, especially since the East Texas field came in to supply the Louisiana group with a large part of their requirements.

Pipeline practice of today

bears little resemblance to that when the Mid-Continent industry was young. The collections and moving of crude, gathered from widely separated fields, to common receiving stations on main lines; the automatic features that permit of quick ascertainment of the amount of crude that is moving, any hour of day or night; remote control of pump stations—all would form a ponderous volume on the one subject of transportation.

With the extension of pipeline facilities throughout this area and into more distant refining centers, tank car movement of crude has almost ceased. In fact, the only time rail shipments have come into play in the past five years was in times when pipelines had been unable to keep pace with rapidly mounting production in flush fields; or, as in the case of East Texas, when crude produced in violation of proration orders could not be moved through established pipeline channels. This, of course, meant cut-price crude. Without substantial price concessions, the disparity between rail and pipeline rates would make it prohibitive for anyone to purchase tank car oil.

That refineries of the Mid-Continent area are well provided with crude supplies for many years is obvious. The territory is a vast one totalling about 1,500,000 acres of proved territory. Again, this does not include the huge West Texas and Gulf Coastal areas.

Kansas fields fall quite definitely into southeastern district, central and western. The southeastern, original development of the state, includes some 12,000 wells whose daily average production is around three-fourths of a barrel. It is the partial source of supply for plants of the Coffeyville district, with some of the oil moving by trunk pipeline to Kansas City and Chicago.

Without giving effect to repressuring methods, operating over some of the area now and certain to be extended when adequate price is paid, there is a reserve of easily 12 million barrels. As in the case of the northeastern Oklahoma shallow fields, great increase in recovery can be effected when market conditions warrant.

I. A. O'Shaughnessy, president, Globe Oil & Refining Co., Wichita, Kans.

Promising results have been obtained already in Nowata county, Okla., using the waterflooding method which has been so great a factor in Pennsylvania and New York. Repressuring with air and gas has been carried on for more than 10 years.

In other settled fields of Kansas, including the newer McPherson county developments —some of which is in the flush stage—recent work in the acid treatment of lime formation pays has caused a revision of estimates and it is probably reasonable to say that 250 million barrels can be produced from the area which includes Greenwood, Butler, Cowley, Sedgwick, McPherson, Sumner and Harvey counties. The once famous El Dorado, Augusta and Rainbow Bend pools are included in this district.

Not enough development has been carried on in western Kansas to warrant even a close guess on proved reserves there. A vast territory has been only faintly touched by development and any estimate that would be made might easily be doubled. Lack of market has held down drilling.

We are inclined at this time to call everything in sight in Oklahoma a billion-barrel reserve, with considerably more than half of it come from fields that long ago reached the pumping stage. Except the Oklahoma City there is little flowing production in the state. About 3,700,000,000 barrels had been produced in Oklahoma as of Jan. 1.

Unless one sets out to do a detailed estimate, pool by pool, generalized figures on a territory are all that can be attempted. When we approach Texas, the going is somewhat more difficult than usual. The estimates on East Texas have been revised time and again. A composite of these would fall around 1,800,000,000 barrels yet to be produced. As for other general areas which are tributary to the Mid-Continent refining industry, one excellent authority places the Panhandle area at 104,000,000 barrels; north Texas, which is the Wichita Falls and adjacent sand production pools, at 84,000,000 barrels; west central Texas, including the general Ranger territory, 52,000,000 barrels. The inclusion of the Van pool, together with the Mexia district, with whatever reasonable estimate that might be placed on East Texas, would combine to bring east central and east Texas districts to well over two billion barrels.

Louisiana and Arkansas, exclusive of Gulf Coastal Louisiana, are placed by conservative authorities at 200,000,000 barrels yet to be produced from present fields.

Four billion barrels is an imposing reserve. It is emphasized again that outside this estimate are the West Texas and Gulf Coastal areas. In the latter region the present exploration program is concentrated, to the neglect of Kansas, Oklahoma, north and north central Texas, Louisiana and Arkansas. No additional fields are needed in these territories for the present.

Known areas that promise new fields are numerous in all this vast region. The years of drilling have afforded geological information that affords close control and this, supplemented by geophysical work that has been done over the past five years, have shown the way for the drill.

The Mid-Continent refining industry is firmly established, so far as raw materials is concerned. All it needs is a decent price.

ADVERTISING PAGES REMOVED

Mid-Continent Refined Products *Move by Railroad to* Vast Consuming Public

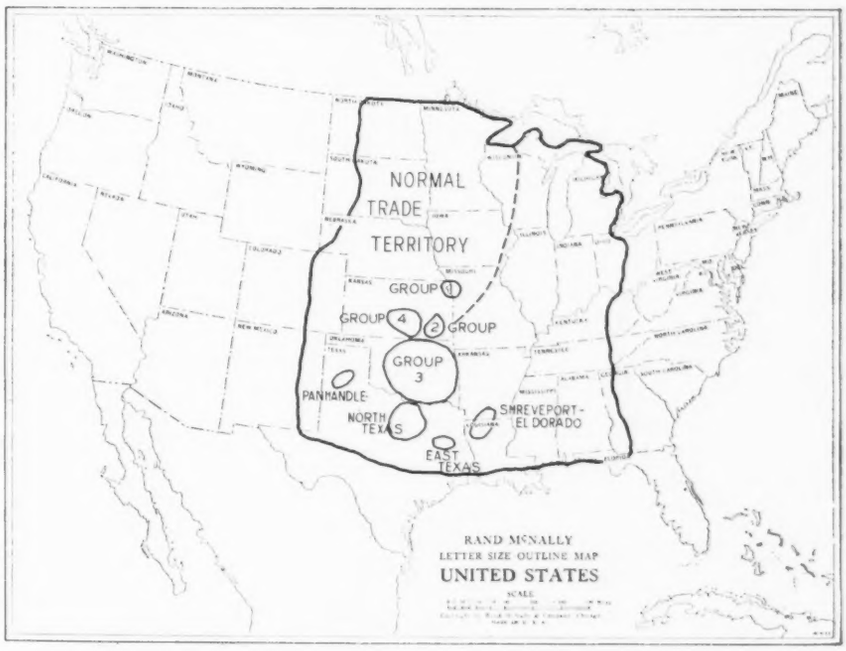
By
Allen S. James
N. P. N. Staff Writer

SHIPMENT by rail is still the chief method of getting Mid-Continent refined products to distributing centers of the country.

Pipelines have cut down the volume of gasoline moved by rail from the Mid-Continent proper, but after all, only six of the scores of refiners in the area have pipeline facilities, and much of the gasoline which leaves the Mid-Continent by pipeline eventually is delivered at destination by rail.

Tank trucks have taken a considerable volume of gasoline from the rails, but the trucks are limited to comparatively short hauls, and the railroads in recent months have won back some of this business by cutting drastically their rates for short haul business. The railroads are still relied upon for the long haul deliveries.

Neither the pipelines nor the trucks, of course, have had any effect on the movement by rail of refined products other than gasoline.



Freight rate groups in Mid-Continent and the normal trade territory of refiners within those groups, based on freight rates from competitive refining districts outside the Mid-Continent proper. (Map Copyright by Rand McNally & Co., Chicago)

Long trains made up entirely of tank cars leave railroad terminals in the Mid-Continent every day on schedules as exacting as those of passenger trains. Some of these trains move on schedules little slower than passenger train time directly to large distributing centers, like Kansas City and Chicago. Others move to railroad junctions, where they are broken up and the cars distributed to the various lines at that junction for movement to destination.

This vast movement requires constant attention. The very nature of the contents of the tank cars calls for rapid movement to destination. Delays are costly, deliveries on time often imperative.

Every refiner, therefore, has a traffic department—a department just about as important as his sales department. The sales department gets the business—the traffic departments gets the products to destination.

The sales manager receives an order, say, for five cars of gasoline, to be shipped at the rate of a car every other day. The sales manager's job is completed. He has booked the order, so he turns it over to the traffic manager. The traffic manager notes the destination. He knows, or quickly finds in his tariff, the freight rate in cents per gallon to that destination. He determines the railroads over which the shipments are to move, if the buyer has not already specified the routing.

These shipping instructions are furnished the shipping clerk at the refinery. The traffic department has a constant record

C. H. Dresser, director in charge of industrial naphtha sales, Anderson-Prichard Oil Corp., Oklahoma City

of the number and numbers tank cars available for loading at the plant, and those already "spotted" at the loading racks.

In some instances the traffic manager specifies the number of the tank car to be used for the shipment. In other instances, particularly in the case of orders for the more commonly used products, the traffic manager or an assistant specifies which car, already, loaded, is to be shipped on an order.

Railroads serving refineries in the Mid-Continent have cooperated with traffic managers in working out schedules for rapid gathering and movement of refined products. Definite schedules have been set up, so that the tank cars can be delivered to nearby terminals in time to be placed in train lots for movement to larger junctions.

At a predetermined time each day, therefore, the traffic manager's department or the refinery sales department furnishes the railroad serving that refinery with a list of tank cars to be moved out, together with the shipping instructions. At that time the loading racks at the refinery are "closed," and the switch engine drags out the loaded cars and "spots" empties for loading.

The loaded cars are cut into trains bound for the nearest terminal of that road. At the terminal the shipments from all the refineries served by that road are collected into one or more trains for rapid movement to junctions.

When the shipment is delivered to the railroad, however, the refinery traffic manager's job has not been completed. He receives daily reports of car clearings at terminals and railroad junctions. He can tell, therefore, just about where each shipment is at a certain time. It is his department's job to keep track of those shipments.

In order to keep up with the shipments an intricate file system is maintained in most refinery traffic departments. These files show the numbers of the tank cars and the filing moves almost in unison with the shipment.

Many refiners own all the tank cars they use. Others own some of the tank cars and lease others, and a number lease all the tank cars they use.

It is imperative that they get the empties back as quickly as possible. This is true especially of refiners who own their own tank cars, because they are allowed 1.5 cents a mile—by the railroads—and the more miles a tank car rolls up each month the lower the cost of operating the fleet of tank cars.

The traffic manager is advised when a shipment reaches destination. He knows, therefore, that, within a few hours, the empty tank car will be on its way back to the refinery. The railroads furnish traffic managers also with junction reports daily which show the delivery of empty tank cars from one railroad to another. The traffic manager knows, therefore, almost any time where an empty tank car is, and about how long it will be before it reaches the refinery.

E. S. Karstedt, vice-president in charge of sales, Continental Oil Co., Ponca City, Okla.

Myers Gross, sales manager, Vickers Petroleum Co., Wichita, Kan., familiarly known to the jobbing trade as "Pete Roleum," editor of the "Gusherville News"

The empty tank cars, as they reach the refinery, are classified as to serial number, and grouped under "clean," "dirty," "lube," "coil," and "compartment" cars. It is an easy matter, from these records, to determine and notify the railroad which cars are to be spotted at certain loading racks.

The refining department has its place in this routine of quick movement of products.

At virtually every refinery storage tanks are tested every morning at 7 o'clock. When a commodity has been finished and is ready for the market it is run into a storage tank from which loading into tank cars is done. This tank is then classed as "on test."

Before loading is started each morning a sample is taken and tested in the laboratory. If the contents are up to specification, loading into tank cars is permitted. The tank may be only partly empty that day, yet the next morning the samples are

The Directors of the National Bank of Tulsa Announce the Election of the Following New Members to the Directorate of This Bank:

MR. JOHN H. DUNKIN
MR. CLARENCE H. LIEB
MR. THOMAS S. LOFFLAND
MR. CHARLES J. WRIGHTSMAN
MR. EDWARD H. CHANDLER

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Preferred Capital	**$4,000,000.00**
Common Capital	**$2,000,000.00**
Surplus	**$2,000,000.00**

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taken just the same.

After the tank car is loaded, samples are taken directly from the car, tested at the plant laboratory and the tests compared with those taken directly from the tank which is "on test." This procedure prevents any "mix-up" in loading, such as pumping from the wrong storage tank.

The sample taken from the tank car, after it is loaded, is kept in the laboratory for three to six months. The sample is labeled by serial number and if any question arises as to the specifications upon arrival at destination, this sample serves as a check for comparison with the sample taken from the car at destination.

In some instances the specifications of the contents of the car are attached to the bill of lading, which, incidentally, shows the number of gross gallons and the temperature, and the net gallons corrected to 60 degrees F.

A tank car containing gasoline is never loaded more than shell full. That is, no gasoline is loaded into the dome. An outage of 2 per cent is allowed in the case of ordinary gasoline, although higher gravity gasoline are allowed more space due to their increased volatility.

The temperatures usually are taken near the top of the car's contents, in the middle and at the bottom, and the readings

H. A. Trower, vice-president in charge of sales, Phillips Petroleum Co., Bartlesville, Okla.

J. V. McCormick, sales manager, Marathon Oil Co., Tulsa

averaged in making the temperature correction. The thermometer usually is suspended in the gasoline for 15 minutes at each position.

In the case of lubricating oils, however, the thermometer is suspended for an hour or more at each position.

After the sample from the tank car has been tested and compared with the sample from the storage tank, the laboratory gives a "release" for that car, and it is then ready to be dragged from the loading rack and started on its journey.

Refiners who own their own tank cars also maintain repair shops. Inspectors examine every tank car that is received, checking particularly the outlet connections for possible leakage and the safety valves. The safety valve for gasoline tank cars is set at 25 pounds per square inch.

Tank car companies which lease cars to refiners have their cars inspected, usually by railroad inspectors or their own men. Major repairs are done at advantageously located shops in the Mid-Continent. Every precaution as to safety and efficient delivery of products is taken. The Interstate Commerce Commission rules must be adhered to at all times. For this reason a railroad inspector examines every car before it is allowed to move from the plant.

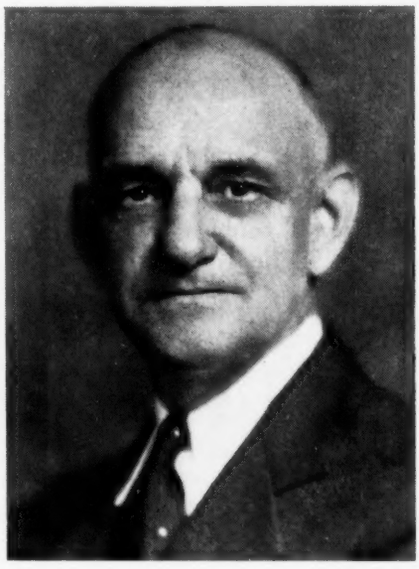
The routine movement of products is not the only task of the traffic department. It must keep abreast of the tariff changes made by railroads or ordered by the Interstate Commerce Commission. And due to the highly competitive nature of the refined petroleum business, the freight rate structure is rather intricate.

Some years ago the Interstate Commerce Commision recognized the competitive nature of the business and designated groups of refineries which were given identical rates, and later established differentials between groups.

The accompanying map shows the groups in the Mid-Continent, together with the normal trade territory of the combined groups. Group 1 is formed around the refineries at Kansas City. Group 2 was formed around the refineries at Coffeyville, Chanute, Neodesha, and Joplin. Group 3 originally was a group of refineries in northeastern Oklahoma but later was extended to include most of Oklahoma. Group 4 was formed around the Arkansas City, Wichita, Potwin, El Dorado, McPherson refineries and others in that immediate vicinity.

The North Texas group was formed around those at Wichita Falls and nearby points, and for some shipments the Fort Worth plants were included.

The advent of refining in southern Arkansas and northern Louisiana resulted in the



F. D. Bostaph, sales manager, Texas Pacific Coal & Oil Co., Fort Worth, Tex.

This is "Les Go"

Broadcasting for Rock Island Refining Company . . . . . .

"This being a special Mid-Continent issue, I thought I'd take an extra minute between rounds in my fight with "Ken Stop," to say a few words about my backers, Rock Island Refining Company."

"You know, they make five different grades of gasoline at the refinery in Duncan, Oklahoma. The names of those gasolines are: *Rock Island Anti-Knock, Rockilene, Winter Special, Rock Island 400 EP, and Special Motor grade.* And are we all proud of those gasolines! We'll guarantee 'em to put the "k-o" on anything your competitors are selling. Then, too, we make a water-white grade of kerosene, a fine 38-40 prime white distillate, and tractor fuel."

"I think maybe that I ought to mention that refinery of ours, down at Duncan, Oklahoma. It's not the *biggest* refinery in the mid-continent area, nor is it the *smallest.* We built it right on the main line of the Rock Island railroad that runs south out of Kansas City. There's always some building going on out there . . . . some new equipment going in. Some of the fellows were saying the other day that the refinery had been "modernized" three times in as many years."

"Right near the refinery itself is the field where we get the crude to make these fine gasolines . . . Stephens County crude . . . . the refinery manager says that there's no sweeter crude anywhere. He says that everyone knows Stephens County crude has kind of a knack for turning into high anti-knock gasoline when they refine it."

"And say, when you order some gasoline from Rock Island, do you get service! I kind of imagine that the traffic manager used to be a boxer, for he can sure throw some fast ones, (orders I mean), in his department. He tells me that if a jobbers order gets in before noon, that it's rolling before he goes home at night! Of course, he might not be able to get the gasoline every single time, but it's mighty seldom that the order isn't in the tank and on its way within 8 or 10 hours after being received."

"Why don't you try out our Traffic Manager some time? Wire in an order for a tank car or two of Rockilene. See how quickly it's shipped. Then see how you like the gasoline, too. If you're like several hundred other jobbers I know about, you'll order again!"

Excuse me if I get to talking too much about the folks I work for. I've got to get back to the fight now. Maybe I'm wrong, but I've got a feeling that I'm going to knock this pessimist "Ken Stop" for a loop!

What'll you bet?" *"Les Go"*

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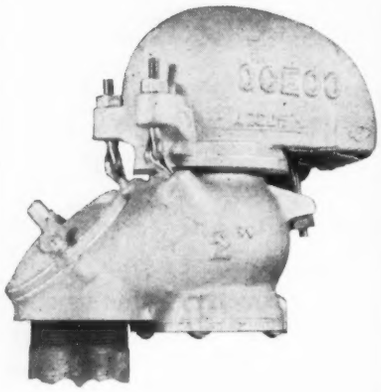

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formation of the Shreveport-El Dorado group. Then came the Panhandle as a center of refining operations and the Panhandle group was formed.

The development of the East Texas oil field has resulted in the East Texas (Longview) group.

From the buyer's standpoint Group 3 has been the measuring stick. He has used Group 3 as a basis in shopping to see if he could obtain his goods at a lower delivered cost by buying from some refinery district outside of Group 3. Due to the freight differentials which have been established he ofttimes can do that. At other times refiners whose own differential territory market has been saturated have accepted a loss by selling into some other territory on the freight rate of the group which normally supplied that territory, and which had a freight advantage over the refiner who was seeking relief.

In establishing the differentials, Group 1 was given a freight advantage over all other groups to the so-called Standard of Indiana territory, comprised of the states of Kansas, Missouri, Illinois, Indiana, Iowa, North and South Dakota, Minnesota, Wisconsin, and Michigan. This differential is 7 cents per 100 pounds. This is almost 0.5 cent a gallon on gasoline. Virtually all of the Standard of Indiana territory, therefore, is considered normal marketing territory for the Group 1 refiners.

Group 2 has a 2 cents per 100 pounds, or approximately 0.13 cent per gallon, differential under Group 3 to most of that territory west of the dotted line shown on the accompanying map. To points east of that line the same rate as that from Group 3 has been assigned to Group 2. This differential as well as those to follow are used for the basis of a general discussion, since there are many factors which cause deviations at some points in the territory and a detailed outline of differentials would be almost impossible. One factor which has caused the most upsets in differentials has been the establishment of the short haul and mileage rates.

The Group 4 refiners have a

Lloyd Lesh, vice-president in charge of sales, Kanotex Refining Co., Arkansas City, Kan.

differential of 3.5 cents per 100 pounds or approximately 0.23 cent per gallon, to most points in Nebraska, and enjoy varying differentials to some other territories, and have the same differential, in general, of 2 cents to the same points as outlined for Group 2. The same rate as Group 3 also applies roughly, to points east of the dotted line.

The normal trade territory for Groups 2 and 4, therefore, could be outlined roughly as that portion north of the Oklahoma-Missouri line, and west of the dotted line, with that territory east of the dotted line as a potential market in direct competition with other groups on an equal freight basis.

The North Texas group has a freight disadvantage of 2.5 cents or 0.17 cent a gallon over Group 3 to most of the Standard of Indiana territory. The same differential applies, roughly, to the Panhandle and the East Texas groups to the same destinations. The refiners in those groups, therefore, must sacrifice on price if they move their products in competition with other groups northward if the buyer is to get his supplies at the same delivered cost that would apply should he buy from other districts.

The North Texas and Panhandle groups, however, have some varying freight advantage to many points in eastern New Mexico and Colorado, and enjoy a freight advantage for

shipment to Gulf ports for coastwise or export movement.

The normal trade territory for those groups, therefore, is immediately surrounding their refineries, eastern New Mexico and Colorado, and whatever export business comes their way. They can, by sacrificing a little, look to the Standard of Indiana territory as a supplemental market.

The East Texas group also can look to the Standard of Indiana territory for a market by sacrificing a little on freight, and can look with much favor toward the Gulf and its export and coastwise market, and finally to the southeastern states where it can sacrifice some freight and compete with the Shreveport-El Dorado group. The export rate from East Texas to Texas Gulf ports is considerably under those from any other point in Texas, Oklahoma or Kansas, and is on a parity with the rate from the Shreveport-El Dorado group to Louisiana Gulf ports. The rates to the southeast in most cases is more in favor of the Shreveport-El Dorado group but the East Texas refiners can count that as a potential market for their products if they need relief.

The Shreveport-El Dorado group have Arkansas and about half of Louisiana all to themselves. The refiners in Groups 1, 2, 3 and 4 cannot hope to compete with that group in that territory without sacrifices, of, in many instances, 0.5 to 0.75 cent a gallon. Much of the territory in the southeast from Tennessee southward as outlined in the map also comprises the Shreveport-El Dorado group's normal market territory, and there are many points in Kentucky, Indiana and Ohio where they enjoy a freight differential under other groups. To other points in standard of Indiana territory, roughly east of the dotted line discussed with reference to Groups 2 and 4, the Shreveport-El Dorado group is on a parity with Group 3, 2 and 4 as far as freight rates are concerned. That territory accordingly is a potential market for products not distributed in their normai market territory, a potential market in a parity with the other Mid-Continent groups serving that area.

3 BARRELS

A masterpiece among antique firearms, perhaps, but hardly adequate for today's protective needs. Modern business demands efficient and economical protection of assets and income producing facilities. How much can you afford to lose needlessly? How much are you willing to take a chance on losing when adequate protection costs so little?

Modern CYCLONE Fence, properly erected will protect your plant and equipment every hour of the day and night. It is a masterpiece of modern protective equipment which is practical because it pays for itself by preventing theft, fire and damage. You don't have to worry about your property when it is "Cyclone Fence" enclosed. Don't waste your income on needless fire or damage replacements.

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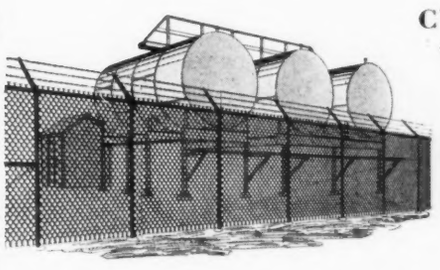

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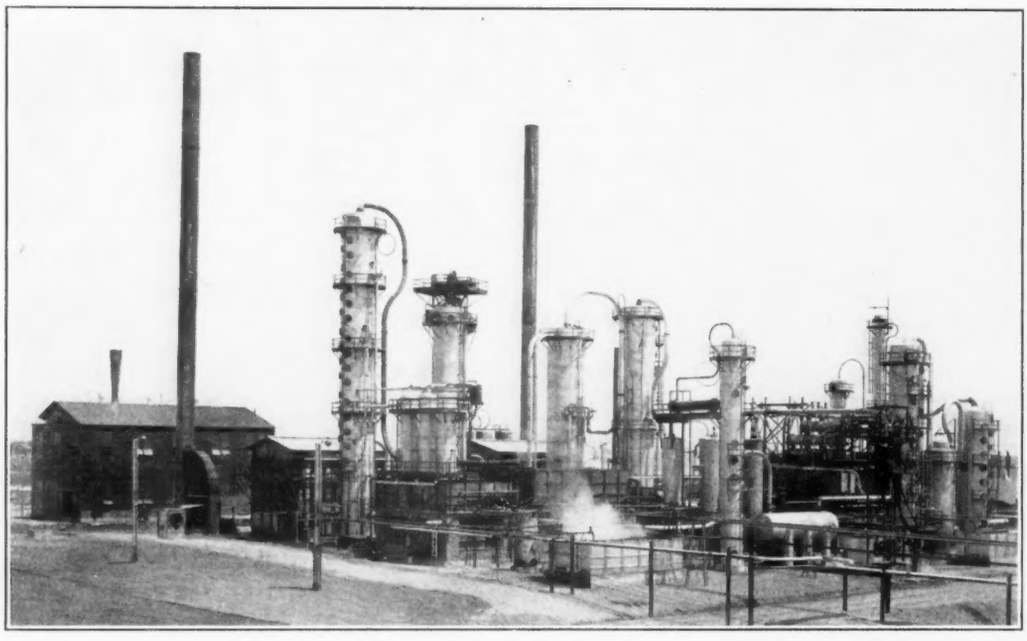

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Champlin Refining Co., Enid, Oklahoma
Col-Tex Refining Co., Colorado, Texas
Cosden Oil Company, Big Spring, Texas
Henry H. Cross Company, Smackover, Arkansas
Deep Rock Oil Corporation, Cushing, Oklahoma
Derby Oil Company, Wichita, Kansas
El Dorado Refining Co., El Dorado, Kansas
Empire Oil & Refining Co., Gainesville, Texas
Empire Oil & Refining Co., Ponca City, Oklahoma
Empire Oil & Refining Co., Muskogee, Oklahoma
Wirt Franklin Petroleum Co., Ardmore, Oklahoma
Globe Oil & Refining Co., Blackwell, Oklahoma
Globe Oil & Refining Co., McPherson, Kansas
Johnson Oil Refining Co., Cleveland, Oklahoma
Kanotex Refining Company, Arkansas City, Kansas
Kettle Creek Refining Company, El Dorado, Arkansas
Lion Oil & Refining Co., El Dorado, Arkansas
Louisiana Oil Refining Co., Shreveport, La.
Magnolia Petroleum Company, Luling, Texas
Marathon Oil Company, Del Rio, Texas
Mid Continent Petroleum Co., Tulsa, Oklahoma
National Refining Co., Coffeyville, Kansas
Olney Refining Company, Olney, Texas
Panhandle Refining Company, Wichita Falls, Texas
Producers & Refiners Corporation, Tulsa, Oklahoma
Ouachita Valley Refining Co., El Dorado, Arkansas
Rock Island Refining Company, Beckett, Oklahoma
Red Ball Refining Company, Pampa, Texas
Root Refining Company, El Dorado, Arkansas
Shreveport Producing & Refining Co., Shreveport, La.
Simms Oil Company, Dallas, Texas
Sinclair Refining Company, Coffeyville, Kansas
Sinclair Refining Company, Sand Springs, Oklahoma
Skelly Oil Company, El Dorado, Kansas
Standard Oil Company (Kansas), Neodesha, Kansas
Star Refining & Producing Company, Fort Worth, Texas
Texas & Pacific Coal & Oil Co., Wynnewood, Oklahoma
Vickers Petroleum Company, Potwin, Kansas
Waggoner Refining Co. Inc., Electra, Texas
Western Oil Corporation, Beckett, Oklahoma
West Texas Refining Company, Pecos, Texas
White Eagle Oil Corporation, Augusta, Kansas
H. F. Wilcox Oil & Gas Company, Bristow, Oklahoma

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"That further improvements in facilities at Globe's Blackwell, Okla. and Lemont, Ill. refineries, ample crude oil supply, and quality of products, has influenced many decisions in favor of the Globe, in recent months."

"IT IS A FACT that Globe neither owns nor controls any marketing outlets—and is a Safe, Dependable Source of Supply."

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GENERALLY speaking, there are two kinds of trade associations. One kind is formed to fulfill a special need, usually a single and passing issue. Once the necessity passes, the association dies. The other kind is founded upon the enduring principle of serving its members in any manner in which it may properly function.

To the latter class belongs the Western Petroleum Refiners Association. It has been in existence 21 years. But one oil association is older, the Nation Petroleum Association, which was founded in 1902.

The W. P. R. A. has "come of age" with its vigor as great as on the day in 1912 when a group of refiners, representing companies whose identities, with but one exception, have been lost, met in Kansas City and formally brought the organization into the world. Along with the change in companies has come a change in the problems of the refining industry but the W. P. R. A., through the years, has been the meeting ground of the independent companies of Oklahoma, Kansas, Arkansas, Louisiana, north and central Texas.

Principal offices, originally in Kansas City, for some years have been in Tulsa.

Activities of the association have been many and varied, but uniformly distinguished by firm adherence to the principle of concerted action for the common good of the members. The central and controlling theme is the study of economics of oil. To this association, economics means no mere collecting and dissemination of statistics. The word has been clothed with its proper meaning and, as a result, the W. P. R. A. members are an informed group.

Howard Bennette, president, Western Petroleum Refiners Association

District meetings are held monthly and the topics discussed there are quite as imposing as those set out for elaborate treatment in the association's annual meetings, although the district meetings are of an informal nature.

President Howard Bennette has been busy recently, for example, meeting with members in Louisiana, in Kansas, in Oklahoma and in Texas, to confer on such questions as the effect of the new "Q" compound; the tax measures enacted by this year's legislatures; the course of proration and its probable effect on oil supply and numerous other subjects of immediate and pressing importance.

Any W. P. R. A. member, therefore, is "educated." He knows what is happening in the oil industry in California and in Pennsylvania, likewise in Venezuela and in Irak. He understands the meaning of the developments, with peculiar and pertinent reference to his own activities.

To be informed on current developments is an essential to the understanding of statistics and the trends they portray. Economic studies were begun years ago as a companion activity to the open-forum discussions which take place monthly. This association pioneered and originated the type of fundamental examination of the industry's condition and forecast that is in common use in the industry today.

It began such analyses in the belief that the statistics collected by the federal government and by other agencies were not being given the consideration and direct application which were essential to a sound business policy. It was necessary also to gather certain statistics, to supplement those published by the federal government as the latter have traditionally been 30 or more days old when issued.

In beginning its work of economic analyses the association issued a special bulletin which became quite famous. This was on Nov. 10, 1925. It is pertinent to note the declaration of policy—ideal, perhaps, is a better word—contained in that bulletin. The article was headed

George D. Locke, vice-president in charge of sales, Barnsdall Refineries, Inc., Tulsa, past president Western Petroleum Refiners Association

"Refinery Profit." Here are a few quotations:

"Primarily, the object of refining as a business is the realization of a profit. The principle of business demands it be conducted with that end in view. Regardless of the significance of legislation, traffic, technology or other matters which at times divert attention, in the final analysis their importance must be measured by their effect upon the balance sheet.

The refiner who fails to subordinate all motives governing the conduct of his business to the single aim of making profits will find that ultimately his ambitions will fall short of realization. He can still dream, but he cannot build, and while he may enjoy the zest of business as much as ever, the time will come when this will be but a memory and one more idle refinery will be added to the list."

The passage of seven years has not added to or taken from that statement. Proceeding, the bulletin declared; "The actions of the industry are but a reflection of the combined judgment of its units and, during recent years, this combined judgment has been in error. There must be a readjustment of conditions based on a change in policy, and this is only possible through cooperative effort. "The campaign of education within our midst should lead to a knowledge so convincing that prices are reasonable and profits restored. Prices that contemplate a fair profit require no agreements or illegal combinations between refiners; they do require, however, a knowledge of conditions that of itself points out a plan of concerted action as natural and responsive as the universal desire to seek protection from a storm."

Such planning could be done only through correct understanding of the facts, declared this bulletin, and after outlining the nature of the economic studies that would be made, it stated this policy:

"We therefore propose that the industry should stabilize profit at the expense of marketing areas in preference to stabilizing marketing areas at the expense of profit."

Had that been the chart and compass of the industry as a whole since the day the declaration was made, how greatly different the situation would be today.

However, the group of refiners comprising the W. P. R. A. did upon this declaration of principle previously quoted. Analysis of the figures on shipments of gasoline over the past six years shows that the Mid-Continent group has refused to give away everything merely to hold gallonage. Shipments of this group have fallen in relation to those of some other areas.

Roy B. Jones, president, Panhandle Refining Co., Wichita Falls, Tex., past president Western Petroleum Refiners Association

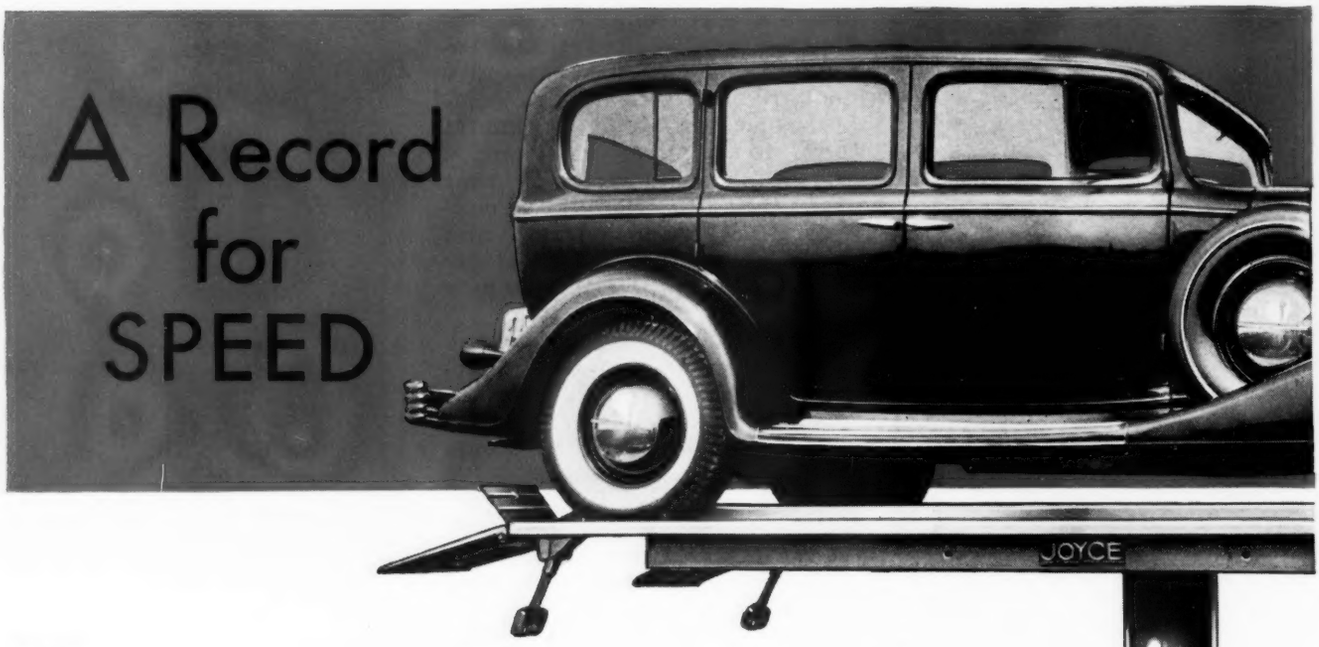
P. M. Miskell, general manager refining division, Empire Oil & Refining Co., Tulsa, past president Western Petroleum Refiners Association

This policy, be it remembered, was no mere bad-weather device. Back in 1925 the situation was not unhealthy, judged from the standard of today. It was a long look ahead that was being taken and a decision that was being made to avoid, so far as possible, the trouble that has since come upon the industry. Never given to sloganeering or propagandizing in the grandiose manner, the association has used consistently one terse expression. It sums up the whole of its economic effort in, "Profits, not Gallons."

In matters where the industry must present a united front, the W. P. R. A. has had a distinguished record. It has concerned itself with legislative matters, with especial vigor where attempts to increase gasoline taxes have arisen in the trade territory of the association members. It wages an unceasing fight to stamp out the tax evasion evil.

Equally important is its activity on specifications. Now and again some state, usually one that has no refining industry, proposes motor fuel specifications based upon wholly illusory reasoning. The W. P. R. A. has frequently been able to introduce sanity into such legislative proposals and throughout the country is regarded as the organization to

A Record for SPEED



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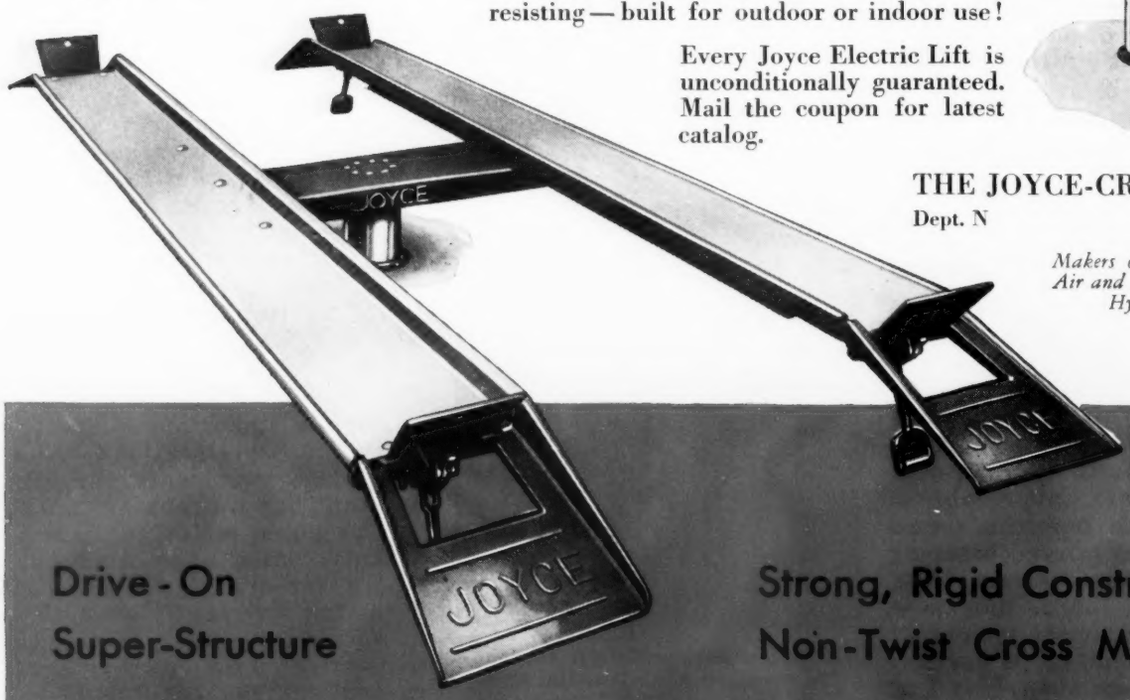

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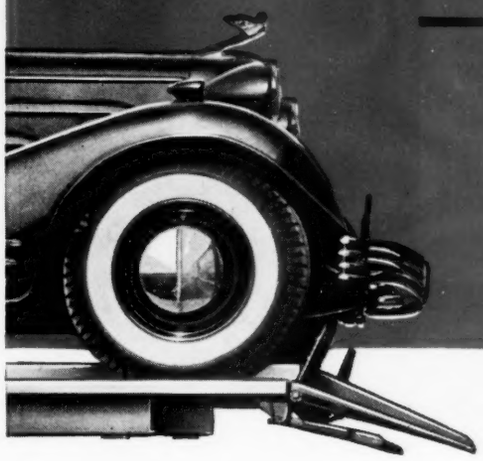

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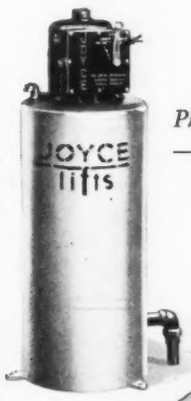

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L. R. Crawford, receiver, Producers & Refiners Corp., Independence, Kan., past president Western Petroleum Refiners Association

supply expert counsel.

One general meeting is held each year by the association and the program offered is always well diversified. Addresses on subjects of current interest, economics and technical questions are provided.

The first formal meeting of the association was held Dec. 18, 1912, and 23 executives of 19 refining companies attended. Of these, only L. L. Marcell, Charles F. Martin, J. S. Cosden and W. D. Richardson are active in the refining industry of the Mid-Continent today. Only the Kanotex Refining Co., of the companies represented, continues under the name it then bore.

W. H. Isom, of the Cudahy Refining Co., was the first president of the association; Frank B. Fretter, National Refining Co., Cleveland, was vice-president; C. F. Martin, Chelsea Refining Co., secretary and treasurer and L. L. Marcell, Chanute Refining Co., treasurer. Mr. Martin is in Chicago, with the Sinclair Refining Co. Mr. Fretter is president of the National and Mr. Marcell is today chairman of the White Eagle Oil Corp.

The association was so firmly organized as to be in position to render valuable service during the War years. Tank car movement of gasoline was a major problem, particularly after the U. S. became a combatant. The co-operative work of the association was of high value.

The roster of presidents of the W. P. R. A. is one of men who have contributed to the founding and enlargement of the refining industry of the Mid-Continent. In the order of succession they were W. H. Isom, D. W. Moffitt, H. G. James, E. E. Schock, Pat Malloy, W. D. Richardson, George N. Moore, F. A. Pielsticker, P. M. Miskell, Roy B. Jones, L. R. Crawford, George D. Locke. These held the position without remuneration. At the recent annual meeting, it was decided to follow the example of the American Petroleum Institute by making the presidency a staff position. Howard Bennette, who has been managing director of the association from March, 1928, to April, 1933, and secretary from 1923 to 1928, thus became president.

Besides C. F. Martin, who served as secretary on a voluntary basis from the organization date to Aug. 1, 1914, six others have held this post. The late Horace G. James was the first to be employed. Robert L. Welch, later secretary and general counsel of the American Petroleum Institute, followed James. Then came Fred W. Lehman, John D. Reynolds, Howard Bennette and A. V. Bourque. The last named has occupied the position for five years.

H. K. Davis, economist, Western Petroleum Refiners Association

A. V. Bourque, secretary, Western Petroleum Refiners Association

The staff organization is known throughout the industry. Mr. Bennette, the president, has been in the atmosphere of oil throughout his career. He is a native of Texas and an attorney. Several years of service in oil company legal departments preceded his entry into association work, which started as secretary of the Texas division of the Mid-Continent Oil & Gas Association.

Mr. Bourque, the secretary, was widely known in the industry as a writer on oil subjects and publisher of oil journals before he was elected secretary of the Natural Gasoline Association of America, from which organization he came to the W. P. R. A. in 1928.

H. K. Davis, the association's economist, has gained national recognition for the analyses which, for several years, he has prepared for the association. He has served on committees appointed to prepare national economic surveys of the character originated by the W. P. R. A.

E. H. Ritter, statistician, and J. R. Mallory complete the executive personnel of the association. The staff is a small one, considering the territory that is covered and the amount of work done.

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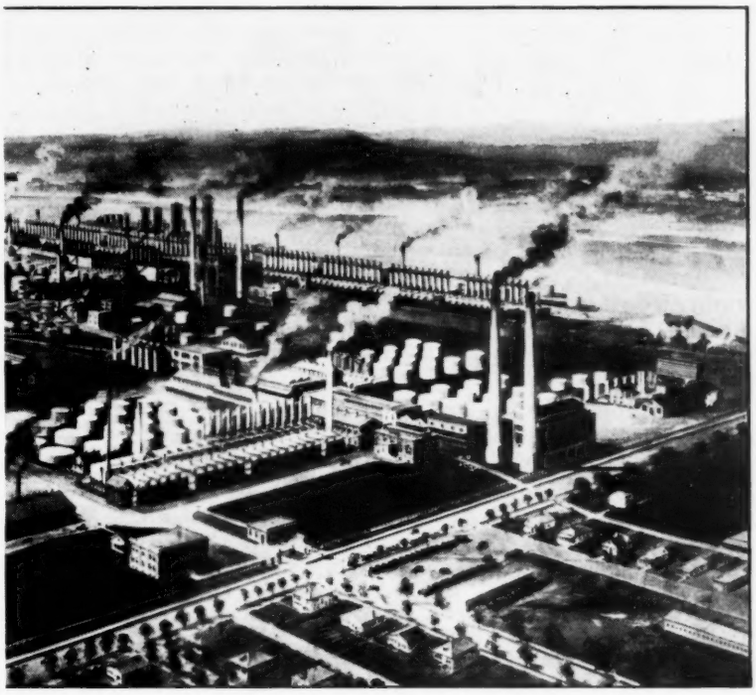

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IMPOSING RECORD

Made in 12 Years by Natural Gasoline Ass'n

WHEN Mr. Sunday Driver wheels his vehicle into the filling station and calls for gasoline, he has little comprehension of the effort that has been exerted to get that gasoline in the form required to take him and his family up the hills to the picnic ground.

Considerable of this effort has been put forth by the Natural Gasoline Association of America, an organization that includes in its membership nearly all the manufacturers of natural gasoline in the U. S., together with their technicians and their sales managers.

For something more than 12 years the association has been protecting and advancing the interests of this division of the petroleum industry, with due regard at all times to the necessity of maintaining proper relationship and accord with other branches of the industry. Activities have been confined to subjects and objectives that were non-controversial as between members, and decisions are reached by practically unanimous agreement. The work has been guided by representative committees, with final disposition resting with the board of directors.

In the technical field the association's record is imposing. In addition to giving close attention to and maintaining supervision over specifications, testing methods, standards and technical, operating and marketing problems, the association has financed several important programs of research at independent laboratories. Some of these were:

"Evaluation of volatility characteristics of motor fuels and determination of fuel characteristics necessary to satisfactory operation of progressively current automobiles." This work has prompted additional study by other associations and companies. Dr. George Granger Brown, University of Michigan, has been in charge of this study from 1925 to date.

Design and manipulative specifications for a gravity balance for the correct measurement of specific gravities of gases. Work carried on at the U. S. Bureau of Standards, 1928-29.

Co-operation with the American Gas Association to standardize and keep up to date methods for determining the gasoline content of natural gases.

Development of the Reid method of absolute vapor pressure determination and securing its endorsement by such bodies as the Bureau of Explosives, Bureau of Standards, American Society for Testing Materials and the American Petroleum Institute.

Ray E. Miller, secretary, Natural Gasoline Association of America

Vapor lock road test research, embracing at least 90 per cent of automobile models now on the road, determining their vapor locking tendencies under different driving conditions, at different seasons, with fuels of varying distillation characteristics and a comparative study of fuel feed system design. Conducted by the Bureau of Standards, under direction of Dr. O. C. Bridgeman, from 1932 on.

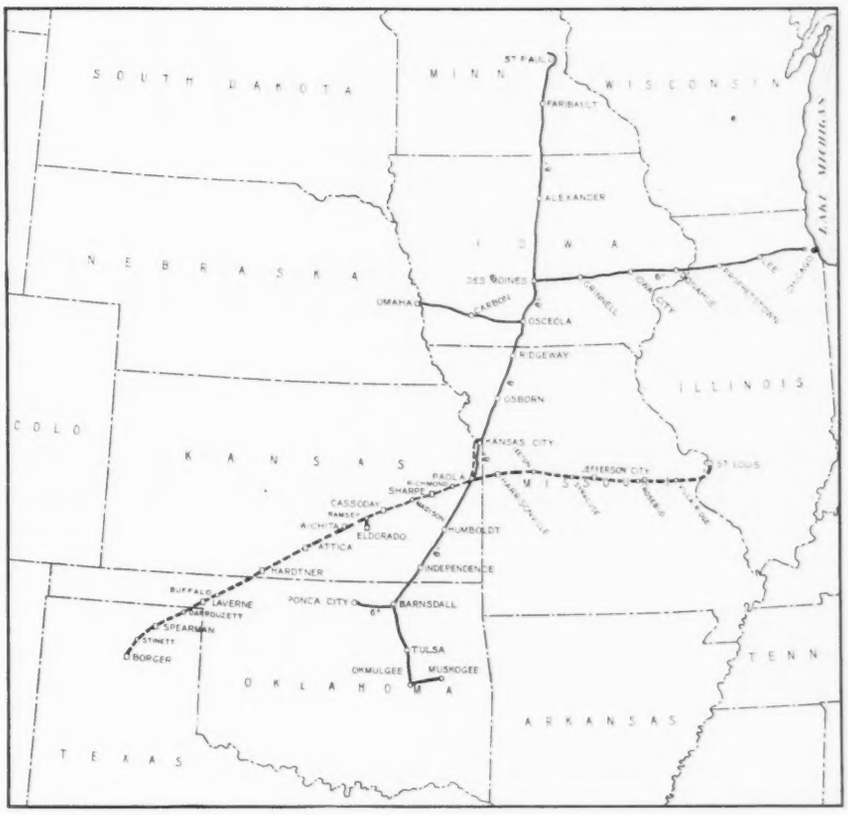
With present development of vapor recovery systems, all these projects have been of value and importance to the refiner and natural gasoline manufacturer alike.

Six men prominent in the industry have served as president of the association. W. M. Welch, formerly of the Tidal Refining Co., was the first, and in succession there followed D. E. Buchanan, now of Hanlon-Buchanan, Inc.; E. L. Peck, Empire Companies; H. A. Trower, Phillips Petroleum Co.; E. R. Lederer, Texas Pacific Coal & Oil Co., and Sydney S. Smith, Shell Petroleum Corp. Each has served two one-year terms.

A. V. Bourque, now secretary of the Western Petroleum Refiners Association, was secretary of the natural gasoline association from 1921 to 1928. He was succeeded by Ray E. Miller, who will soon have completed his fifth year in this position.

Tar Bound Road Study Published

CLEVELAND — The March issue of Public Roads, published by the U. S. Bureau of Public Roads, is devoted to "Tar Surface Treatment of Low Cost Roads." The issue was out March 25. The contents are a report of a co-operative study by the bureau and the tar industry. The study deals with construction and the effects of various treatments. Copies of the issue may be obtained from the Superintendent of Documents at Washington. Price 10 cents.



Map of the two great gasoline pipeline systems which originate in the Mid-Continent. The Great Lakes Pipe Line Co. system is shown in solid black lines while the line of the Phillips Pipe Line Co. is broken. Note the short line from El Dorado, Kansas to Ramsey, Kansas. This short section is part of the Great Lakes line through which gasoline shipments from one of the member companies at El Dorado is carried to a connection with the Phillips line for trans-shipment over that system to East St. Louis, or to be transferred again to the Great Lakes system at Paola or Kansas City

Two Gasoline Pipe Lines Pump 48,000 Barrels Daily From Mid-Continent Refineries

By William F. Lowe
N. P. N. Staff Writer

APPROXIMATELY 48,000 barrels of gasoline are shipped out of the Mid-Continent daily through gasoline pipelines. These motor fuels are delivered through the two great interlocking systems of the Great Lakes Pipe Line Co. and the Phillips Petroleum Co., at terminals located at Kansas City, St. Louis, Des Moines, Chicago, St. Paul, and Omaha.

The longest individual shipment through a single system is over the Great Lakes pipeline between Muskogee, Okla., and Chicago, a distance of 763.5 miles. This system has approximately 1400 miles of line.

Over the Phillips system the longest shipment is from Borger, Texas, where the line originates, to East St. Louis, Ill., the eastern terminus, a distance of 681 miles. This system has a total of 733 miles of line; all but 52 miles of which is 8-inch pipe. The 52 miles, from Paola to Kansas City, is 6-inch.

Though the Great Lakes Pipe Line Co. is an independent organization engaged strictly in the busines of transporting gasoline through its pipeline system, the stock of the company is owned and controlled by six large Mid-Continent oil companies. These companies are; Continental Oil Co., Mid-Continent Petroleum Corp., Barnsdall Refineries, Inc., Skelly Oil Co., The Pure Oil Co., and Phillips Petroleum Co.

These two systems were completed about two years ago and have been operating successfully ever since without any major changes in their physical set-up other than the addition of pumping stations to increase their capacity. Considering the fact that when the projects were started little was known about the mechanics of gasoline flow, the success of the long installations is decidedly complimentary to the engineers who designed and constructed them.

These men based their calculations on friction conditions of water flow in long lines and then corrected them for the gravities

In only five years have established sales record ever of the Oil business. the statement from SuperServiceStations ...Write for complete details of the Phillips franchise.....

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DISTRIBUTORS OF PETROLEUM PRODUCTS
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February 13, 1933

Phillips Petroleum Company
Tankcar Sales Department
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Gentlemen:

We have been able with Phillips gasoline to show an increase in dealer outlets of about 200%, and our own service stations, as well as all of our dealers, have shown a gallonage increase of all the way from 30 to 100% or more over the previous brands that they handled. Our own gallonage thru our own service stations showed about 50% increase against previous brand.

We have had no difficulty in selling this product to the outstanding dealers in our community, and we are to a point in our territory where we are practically saturated, and unable to even consider anymore outlets on account of conflicts, although we are being approached regularly by various dealers.

Yours very truly,

SUPER SERVICE STATIONS, INC.

CHL:HKS

President.

Harry Moreland, vice president and general manager of the Great Lakes Pipe Line Co.

of the products to be pumped. This seemed a logical conclusion. There was one other problem, however, which could only be answered by test methods. This was the question as to whether different kinds of highly volatile liquids could be slugged through the same pipeline without a large amount of intercontamination. Since the practicability of both projects depended upon the favorable solution of this problem, it was a vital point.

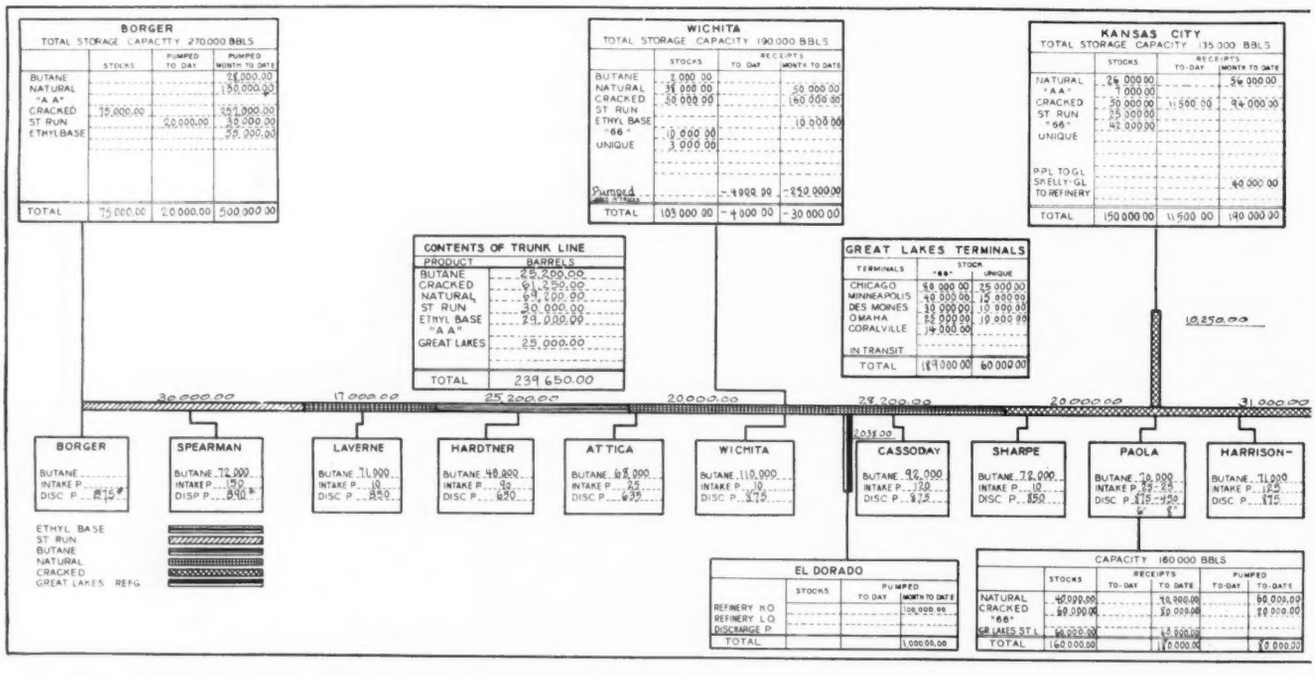
The Phillips engineers answered the question by making a practical test in a looped line between their Wetumka and Cromwell gasoline plants, in Oklahoma. This test was conducted previous to the final decision to construct the bigger line.

The two plants were 20 miles apart and connected by two paralleling 3-inch lines. One of these lines was filled with natural gasoline and the other with liquid butane. The lines were then connected in one loop 40 miles in length, and circulation of the two slugs around the loop was maintained by a single pump until the liquids had traveled a distance of 600 miles.

It was found at the end of the run that but two miles, or only five per cent of the total contents, showed any signs of contamination. Considering the conditions under which the experiment was conducted and the fact that they were more conducive to mixing of the liquids than would be those of the large line, this result was highly satisfactory. It was concluded that so long as the different fluids were kept in turbulent flow the division between them would be more or less sharp.

In the case of the Phillips pipeline, the reason for wanting to ship the different constituents of gasolines in batches, rather than shipping the finished product, was the desire to blend the fuels at a point closer to their markets. In this way seasonal or geographic demands could be met with greater ease and speed. Another reason was to make theft from the line by tapping less attractive. None of the various slugs is a good motor fuel in itself, and the gasoline thief does not have time to do much blending.

The liquids slugged into this line at its source are butane, Ethyl base, cracked, straight run, and natural gasolines. Ship-



A reproduction of a dispatcher's chart of the Phillips Pipe Line Co., showing the contents of the line for the particular date shown. The location and size of each slug in line is plotted on these charts each day in the dispatcher's office in Bartlesville, Okla. From reports received at regular intervals from the various stations he is able to accurately determine the time of arrival and departure of any of the gasolines at any point on the line. Daily stock reports from the stations keep him posted on their needs and he dictates shipments and withdrawals for all points, giving orders as to their size and movements as well as superintending the switching of tender shipments from the Great Lakes system. Note that the short line from El Dorado is standing full ready for such a tender. When the time comes for accepting this shipment, the flow in the main line behind the junction station of Ramsey (shown on the accompanying map) may be directed temporarily into Wichita while the tender is taken on for shipment east. One such slug can be seen being delivered at East St. Louis on the date shown. Note that between this shipment and the large one immediately following there is a 2000-barrel slug of natural. Another may be seen behind the Ethyl base batch. These short slugs

ments may vary in size from 50,000 to 150,000 barrels, depending upon the demand. In addition to these motor fuel constituents all of which are products of the Phillips Petroleum Co., at Borger, Texas, tendered shipments of the Great Lakes from the Skelly Oil Co. are taken on at El Dorado, Kansas.

These shipments are forwarded, intact as slugs, either to Kansas City or St. Louis, as desired. They may also be transferred at Paola, Kans., to the Great Lakes pipeline system for delivery through its lines to its northern terminals. Other transfers made between these systems at this point will be discussed later.

A similar method of slugging is practiced by the Great Lakes pipeline though the character of the liquids does not differ so widely. The six member companies agreed on two standard specifications for base gasolines for both winter and summer, and each is obliged to meet these in all tendered shipments.

These gasolines are spoken of as high and low octane ratings for the two extreme seasons. From these bases each member can build his own special gasoline by blending at the terminals. The special ingredients are shipped to the terminals by tank car.

The tracing of one of these pipeline shipments is interesting. Referring to the accompanying map, it will be noted that Muskogee is the southern terminus of the line. From this point to Okmulgee the line is 4-inch, which has a capacity of 4200 barrels per day. If the Pure Oil refinery at Muskogee tendered a shipment of 50,000 barrels for delivery at Chicago, the front end of this slug would reach Okmulgee in about 14 hours, traveling at the rate of 2.3 miles per hour.

The line from Okmulgee to Barnsdall is 6-inch and has a capacity of 13,000 barrels per day. Considering this increased capacity it is obvious that some of the shipment from the 4-inch line must be stored before it can be started in the larger line. When a sufficient quantity is on hand, pumping can begin and the front of the slug moves north at the increased rate of 2.7 miles per hour.

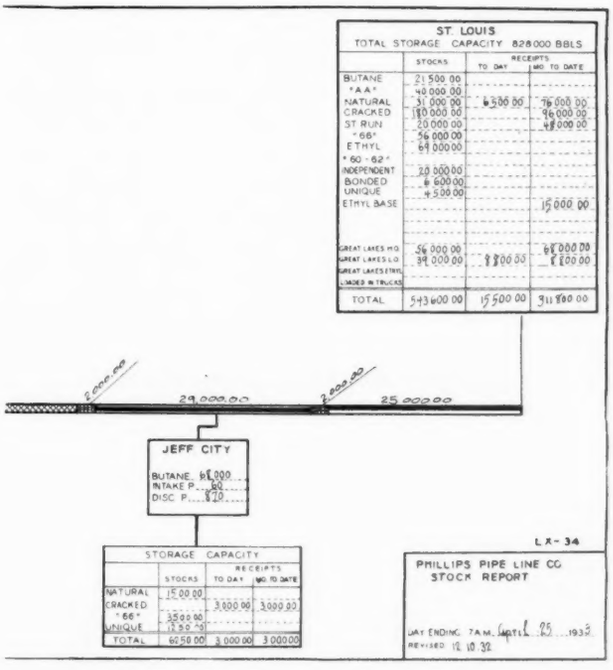
At Barnsdall the size of the line is again increased and storing of a large portion of the shipment is again necessary. The capacity of the 8-inch line from this point through Kansas City to Des Moines is 25,000 barrels per day. This is the longest single uninterrupted journey for the slug and it moves forward at the rate of 3.1 miles per hour, passing Kansas City in 67 hours and reaching Des Moines in 128 hours.

A. W. Hubbell, genereal manager of the Phillips Pipe Line Co., at Bartlesville, Okla.

At Des Moines, due to a decrease in the capacity of the line from that point on into Chicago, storage tanks are again necessary but the reason is just the opposite from that which made it necessary on the south. The smaller 6-inch line could not possibly take all the flow from the 8-inch main line. The stream is directed into large storage tanks where it is gauged to determine over or short on the movement, and the shipment does not start on the last leg of its journey until about one-third of it has been so measured. While the rest is being checked in other tanks the first tank is opened to the line and pumping is started. Here again the rate of movement is 13,000 barrels per day and the total time for the complete delivery has been 19.7 days.

Though this period seems long compared with tankcar movements, the fact must not be overlooked that a week or 10 days of the time was consumed in getting the shipment through the 4-inch line from Muskogee to Okmulgee. Though the distance is only 32 miles, the small size of the line greatly reduces the speed of movement. The average length of time for shipments from other points on the line to Chicago seldom exceeds 10 days and those to St. Paul 13 days.

Ahead and behind this batch are shipments from other points and other companies, the movement of which is closely fol-



of natural are always placed between two large shipments of fuels if the A. P. I. gravity differential between them is not wide enough for quick determination as they come into the terminals. The slugs of natural are quickly noted by the line switchers and the flow of each batch directed accordingly. Checking again with the map it will be noted that aside from terminals only those stations which are operated on butane gas are shown on the dispatcher's chart

A typical way station layout on the Great Lakes Line. The path of the buried line can be seen faintly running diagonally across the photograph from southwest to northeast

lowed by dispatchers. These men know the exact position of each slug at all times by checking with the various terminals and pump stations every hour. The central offices are connected with these points by telephone and teletype, the telephone serving as a dispatcher's circuit to all stations and the teletype for messages from the terminals.

The chief dispatcher, located at Kansas City, occupies the same position in this pipeline system that a man holding a similar position on a railroad does. He is in direct charge of all shipments and determines the time each shall run, which will be held while others are allowed right of way, and how any batch is to be split up for delivery at several points. He and his three assistants, the latter working in eight hour shifts, also can regulate the speed of shipments by controlling the pump speeds.

All of this slug control is graphically illustrated in the dispatcher's chart, shown in an accompanying drawing. This chart was picked at random from those in the dispatcher's office of the Phillips Pipe Line Co., at Bartlesville, Okla. It pictures the contents of the line for that particular day. A chart of this kind is filled in each day and serves as a record of all shipments.

Though most of the butane shipped through this line is carried through to St. Louis, where it is marketed as liquefied gas for commercial and domestic consumption, it is also used as fuel in most of the pump stations now operating on the line. Each such station can take any part of a butane slug that may be passing through, storing the liquid in 500-barrel cylindrical tanks which rest horizontally on concrete supports.

Since butane is a liquid at atmospheric pressure only so long as the temperature is held below freezing, it is necessary that the pressure on it be raised if the temperature cannot be maintained at that point. The tanks in use are tested to 80 pounds though but half this amount is sufficient to keep the butane in a liquid form. Released from the tanks in moderate temperatures, it becomes a gas in the feed lines to the 6-cylinder, 260 h.p., vertical gas engines which operate the centrifugal line pumps.

The original eight pump stations on the Phillips line were located approximately 90 miles apart and the capacity of the line was 18,000 barrels per day at an average working pressure of 750 pounds. Three more stations of the type just described were added during the first year and raised the capacity to approximately 25,000 barrels. Recently, six new booster stations were added along the same portion of the line, between Borger and Paola, which jumped the capacity of this section about 20 per cent, or 5000 barrels. The pumps in four of these boosters are operated by 250 h.p., electric, motors. Two others of similar type are being added between Paola and St. Louis, and locations have been selected for two more should they be needed.

The reason for placing these stations along this section of the line was due to an arrangement with the Great Lakes system, completed last December, to carry bulk shipments of Phillips "66" gasoline from Kansas City to northern points. Previous to that time the Phillips had been sending through the Great Lakes system only the specification base gasolines and had been shipping constituents for blending from St. Louis by tank car to northern terminals. This blending is now done at Kansas City and it was necessary to increase the capacity of the line from the source at Borger. This reciprocal agreement also allows the member companies of the Great Lakes to ship over the Phillips line to St. Louis.

While on the subject of booster stations and their equipment, it is interesting to note that the Great Lakes line has the only self-contained type,

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electrically driven pump, the motor of which is cooled by the gasoline as it flows around it in the pipeline itself. This unit is a wide departure from the usual pumping methods, since it really is a part of the line, and the idea of cooling an electric motor with gasoline is novel to say the least. The motor is rated at 700 h.p., and drives an eight stage pump rated at 37,000 barrels per day. The striking feature of this unit, however, is the fact that it has an efficiency rating of 80⅛ per cent—almost as high as that of reciprocating pumps. The unit is not housed and may eventually be entirely operated by remote control from the dispatcher's office. It was designed by D. J. Moran, president, and E. O. Bennett, chief engineer, of the Continental Oil Co.

Other pump stations on the Great Lakes line, spaced approximately 50 miles apart, vary in their equipment with the different size lines to which they are connected. The arrangement and equipment are identical on the same capacity lines; the pumps being horizontal duplex plunger units driven by 6-cylinder solid injection, diesel engines. Tankage at the various intermediate stations for each product shipped is sufficient to care for one day's capacity of the line. This is a safety measure in the event of trouble.

On this line Kansas City is the first big terminal though it is also a way point. Aside from the auxiliary tanks there are also a number of large floating-roof tanks for storage purposes. The word storage when used in connection with the tanks of this line, however, does not have the same meaning that it might in a large bulk plant or on a tank farm. They correspond to railroad warehouses in which the various products are held temporarily until called for. They are all considered working tanks.

All of the terminals have tank-car type Ethyl blending plants and Ethyl gasoline is loaded out from the railroad loading rack. In this connection it is well to note that there is no trucking of products from any of the terminals. All of the gasolines are removed from the terminal tanks to loading racks and complete their several journeys to bulk storage plants of member companies by tank car. Each company blends its own special product from the base gasolines, either in the working tanks made for that purpose or in the lines to the loading racks, but their own men have to do this work.

Naturally, Chicago is the largest of the Great Lakes terminals. There are six 80,000 barrel tanks located at this point and tank car loadings average about 70 cars per day.

On the Phillips line, St. Louis is the major terminal, with a total storage capacity of 828,000 barrels. All gasolines except natural and butane are stored in 55,000 and 80,000-barrel floating-roof tanks which reduce fire hazard and hold evaporation losses to a minimum. The natural gasoline is stored in 20,000-barrel spheroid tanks in which it can be held under about 20 pounds pressure. Six vertical tanks, measuring 30 x 70 feet, and supported on legs resting on large concrete bases are used for storing the liquid butane. These tanks have a working pressure of 50 pounds.

Unlike the terminals of the Great Lakes system, those of the Phillips line are equipped for loading out the various products either by tank car or by truck. It is true that the major portion is transshipped by railroad but trucks account for a considerable volume particularly at East St. Louis. This terminal also has a loading dock for river barges on the Mississippi and shipments of this type are to be started in the near future though the barges will not be the property of the Phillips. These barges have a capacity ranging up to 7000 barrels.

Unquestionably the long distance transportation of motor fuels through pipelines is a success. The feasibility and practicability of such projects have been proven in several other places outside the Mid-Continent but the two systems outlined are the largest in existence.

C. A. Keller, sales manager, Derby Oil Co., Wichita, Kan.

H. E. Bangert, manager tank car sales department, H. F. Wilcox Oil & Gas Co., Tulsa

H. G. Plane, sales manager, Johnson Oil Refining Co., Chicago

Growth of Independent Marketers in West *Aided by Refiners*

NOWHERE else in this country, probably, are independent marketers as strongly entrenched as in the trade territory of the Mid-Continent refiners.

And nowhere else does the really independent buyer have as a large a choice from which to buy his requirements as in the Mid-Continent, with its scores of independent refineries.

Little wonder then that Mid-Continent refiners, from the smallest to the largest, have alert sales departments, which must keep "on their toes" in the vigorous competition for the business coming from their normal trade territory.

These sales departments not only get business for their employers but they help the marketer build up his business.

E. J. Glover, vice-president in charge of sales, Rock Island Refining Co., Duncan, Okla.

Some of the larger refiners maintain division sales offices, as well as a main office at the company's headquarters. They also have salesmen constantly contacting the trade in their territory.

The refining companies, in many instances, have contracts with virtually all the customers they supply in this territory. The marketers, on their part, have found it to their advantage to be under the advertising and marginal contract protection covering of some established refiner.

Such contracts give the marketer the advantages of considerable advertising done by the refiner in keeping the company's branded products before the eye of the buying public. Some refiners also furnish large amounts of advertising to their contracted marketers and also give them merchandising aids of some form or other.

Some refiners have their own retail distribution and see it to their advantage to dove-tail the independent marketer's business in with their own whenever possible.

Various advertising methods are used by refiners, in which the independent marketers under contract with them share. One company, for example, has sent specially equipped automobiles throughout its trade territory giving demonstrations before high school classes showing the difference in operation of various gasolines in the engine.

Several companies have conducted contests, with the suggestion that the detailed information be obtained from the "nearest dealer."

Radio advertising also is used and, in some instances, a certain portion of the amount of the marketer's purchases is set aside for special or local newspaper advertising.

A large number of independent marketers in this territory have built up a profitable business on their own brands. They do not want to take on the brand of some other company. Accordingly, they are "open market" buyers or they buy from a refiner who does not insist that his brand be used exclusively. Some of these marketers have contracts with refiners, and are aided in their advertising by these refiners and ofttimes they are aided in their merchandising problems by the refiner's sales department.

A large number of marketers, also, do not handle any particular brand. They do not tie themselves up on contracts. They buy where they please and "shop" for the best prices.

These marketers in most instances turn to the smaller refiners who do not have extensive sales departments. Many times one, two or three individuals make up the refiner's sales force. He furnishes no advertising. He has no branded product to push. He must depend on the market from day to day—and on the marketer who wants his requirements at the best price possible.

It is only natural that these

H. W. Coleman, sales manager, Simms Oil Co., Dallas, Tex.

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[redacted] To be read by [redacted]

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If the dissension over lubricated gasoline has left you slightly jittery, consider: We originated several internationally known and *liked* top oils; we have successfully lubricated over a *billion* gallons of gasoline—all at a cost that *you* can afford—even today. And our products, while not oils, are all pure petroleum—Pennsylvania at that. *Get the story.* Your letterhead will suffice.

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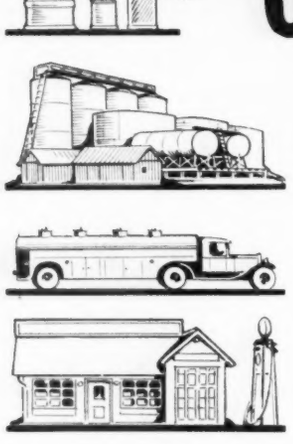

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two classes of refiners and marketers should depend upon each other, for they each have a definite place in the marketing of Mid-Continent products.

Mid-Continent refiners have a particularly wide distribution of their own motor oils. Many make their own stocks and neutral oils and blend their own motor oils. Some buy their materials from other Mid-Continent refiners and do their own compounding. Large quantities of Mid-Continent motor oil materials are used annually by the large compounding plants located in the middle west.

In the marketing of these motor oils the sales departments of Mid-Continent refineries have their place. Several refiners with their own brands each spring send out their salesmen with representatives of independent marketers to call on the farm trade in that marketer's territory. What is generally called "pool car" selling of motor oils is done.

The farmers purchase the amount of oil they will need for planting and harvesting. The salesmen help the marketer make up the carlots. The material is delivered at a designated time and the farmers usually given until harvest time to pay for the purchases.

The salesman has not only helped his company get larger distribution but has helped the marketer put more dollars in his pocket.

D. B. Williams, executive vice-president. Chalmette Petroleum Corp., New Orleans

Mid-Continent Refiners Move Part of Their Plant Output on • • • • • • • • Yearly Contract with Marketers

By Allen S. James
N. P. N. Staff Writer

CONTRACTS with hundreds of independent marketers in the middle west provide the foundation for the distribution of a large portion of the refined products of Mid-Continent refineries.

There probably is not a single refiner in this district who does not have several contracts in his files. Some make a practice of contracting only 5 to 15 per cent of their plant's output, while others contract larger percentages. Several refiners, on the other hand, have sufficient contracts to take all their products not distributed through their own retail marketing companies.

Refiners and marketers alike have found, over a period of years, that these contracts work to their mutual advantage in many ways.

The average marketer is too busy building up his own marketing business to devote much time to "shopping around" day by day for all the commodities he sells. He may want to do some buying on the open market but he has a feeling of security if he has contracted with a reputable refiner for at least a portion of his requirements.

Experience has taught the marketer that the open market cannot always be depended upon as a constant source of supply. He may be able, for long periods, to save money by shopping around but there have been times, in the past, when a contract assured him some oil in his storage tanks, despite the scarcity of the commodity in the open market.

Many marketers, accordingly, contract for the minimum of their requirements. They pick up, in the open market, the gasoline, or other products necessary to supply any seasonal or unusual increase in their business.

Some marketers have found it advantageous to contract with a refiner for all their requirements. They then know they have a constant source of supply, of a uniform product. In many instances these marketers also have the advantage of the advertising done by the refiner for his branded or trade marked products.

A refiner cannot accept a number of orders, fill them and cease operations until a new lot of orders is received. He must keep operating or suffer heavy losses in shutting down his plant and starting up again.

A. E. Landsittel, sales manager, Globe Oil & Refining Co., Wichita, Kan.

Contracts, therefore, are to him a guarantee of steady operation of his plant. He knows that he has an assured outlet for a certain percentage of his production and he can gauge his operations to dovetail fairly well with this assured market. If the market is active he can get into open market trading. If demand is light, he still has his contracts to fall back on.

To many refiners, contracts with jobbers assure a uniform distribution of their products. These refiners may have their own retail marketing divisions but they have found it is desirable, in many communities, to let the "home owned" company distribute the oil rather than for the "big, outside oil company" to attempt to market in that locality. This supplementary distribution is highly desirable in many sections of the middle west.

There are in existence contracts covering virtually all refined products made in the Mid-Continent.

The largest number, however, cover gasoline, kerosine and motor oil sales. Furnace and gas oil contracts are pretty much a seasonal proposition while fuel oil contracts are mainly with railroads are large industrial consumers.

The majority of gasoline contracts are written on a "market price date of shipment" basis. The price charged the buyer is obtained from prices carried in one or more daily or weekly trade publications.

Some refiners, particularly those who do not make it a

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See complete story on pages 57 to 60

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Specializing in—

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point to market their own branded oils, have no provision in their contract other than the market price date of shipment. The buyer gets his gasoline or kerosine "at the market" regardless of the retail price structure in his own locality.

Most of the contracts in existence at present, however, also include a marginal protection clause. The refiner agrees to sell the marketer at the market price and also agrees to guarantee him a certain margin under the general service station price in the marketer's territory. This clause protects the marketer in periods when the refinery price of gasoline is sufficiently high, in relation to the service station price, that there would be little, if any, profit at the going refinery market price.

Most refiners offering this type of contract endeavor to make the marketer a 100 per cent distributor of their products. In many instances the marginal protection is not given unless the marketer signs a 100 per cent contract.

Refinery contracts run for a year or more but can be cancelled upon written notice within certain periods. In some, the refiner reserves the right of option on the distributor's business should he ever desire to sell.

Virtually all the 100 per cent contracts list the minimum and maximum requirements of the various oils bought. A few refiners recently have inserted in these contracts a clause prohibiting the marketer from reselling in tank car lots any oil bought on contract. This was done to prevent a repetition of a situation of several months ago, when several marketers took advantage of their marginal protection and resold the gasoline to other marketers when the tank car price was relatively high, as compared to retail price, and gasoline was scarce in the open market.

Refiners agree, in their 100 per cent contracts, to furnish the marketer with various forms of advertising and equipment. A few refiners changed their clauses recently and, instead of guaranteeing the marketer a specified amount of equipment or advertising and trade pullers, agreed only to supply "what the seller deems necessary."

Refiners are more lenient than formerly with their 100 per cent contract customers, permitting them now, in many instances, to handle one or more branded oils other than the one sold by the refiner.

The third grade gasoline has offered a problem. Refiners in most instances, however, have worked out individual arrangements with their customers to protect them on third grade prices, rather than to have them buy elsewhere, in times of price wars.

No protection is offered marketers on kerosine purchases. In the case of furnace and gas oil, a few contracts carry a maximum and minimum stop clause. The market date of shipment price is used but the price cannot go above or below a certain figure. This protection is given in order that distributors of these oils can make their seasonal contracts with consumers with some assurance of having a margin of profit. Many of these seasonal contracts between distributors and consumers of these heating oils are made in the summer or early fall and it is only natural that refiners give some assistance to their marketer customers.

Fuel oil contracts are made principally with railroads and large industrial users. These contracts are based on the market date of shipment, or on a certain percentage of the price of a specified gravity of crude oil in the Mid-Continent, or a combination of both.

Refiners apparently have gotten away from the maximum and minimum stops in their fuel oil contracts. When they make contracts for a period of time at a flat price, however, they usually specify that any change in crude oil prices will be reflected in their price for fuel oil.

NORMAN, Okla., May 6.—Prof. H. C. George, director of the school of petroleum engineering, University of Oklahoma, will be a member of the staff of the summer school for engineering teachers at the University of Wisconsin July 5 to 25.

You Can Cut Costs and Lose Money

Maybe you can make refined products at low cost, but that doesn't do any good unless you can sell them at a profit.

Many a refiner has put himself in a bad fix by cutting down his unit manufacturing costs. Because to do that he had to increase his output—he had to make too much stuff.

That busted his market. That meant cutting prices to sell his material—and he had to sell it.

So he lost all he gained through lower manufacturing costs—and more.

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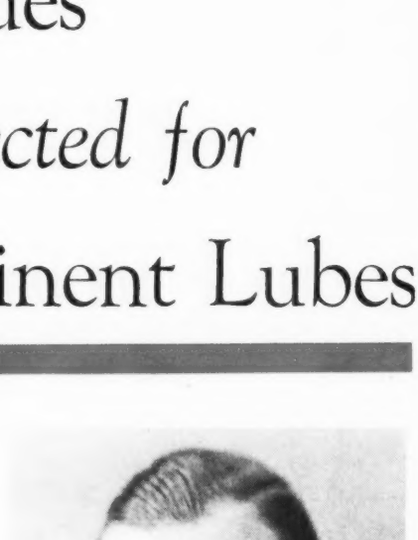
Special Crudes *Are Selected for* Mid-Continent Lubes

PRODUCTION of 13 per cent of the lubricants made in the United States in 1932 is the achievement of Mid-Continent refiners located in this geographical area. This figure does not include all lubricants made from Mid-Continent crude, but includes only the production from Mid-Continent plants located in the Mid-Continent.

Crude from the area is transported to the Chicago and lakes area, to the Gulf Coast, and to the east coast for making lubricants and the production from these large midwest, Gulf and eastern plants is considerably larger than that in the Mid-Continent itself.

Eighteen refineries in the Mid-Continent operate lubricating oil and grease plants. Practically all Mid-Continent crudes are potential sources for lubricants; experience, and experiment, has shown however that about a half dozen crudes from various sections give the best results as to quality of finished oil, amount of refining necessary, and availability of the supply for any individual plant.



F. B. Koontz, vice-president in charge of refining, Mid-Continent Petroleum Corp., Tulsa.

K. J. Smith, refinery manager, Skelly Oil Co., Eldorado, Kan.

Price of the crude laid down at the plant is of course some consideration, but a minor one where quality of the finished material is concerned, as is the case with lubricants.

Among the crudes which are used by one or more lubricant makers are: Ranger, Texas; Oklahoma City; Seminole, Smackover, Ark.; Osage, Burbank, and Garber, Okla. Others may be used on occasion, but these are most widely refined for this purpose. Refineries receiving crude via pipeline in the east and midwest obtain these or similar crudes for their entire plant supply, the selection of crudes being made in the field for the pipe line.

In handling crudes for local refiners, in some cases the plant operates entirely on the crude which is used for lubricants. In this case no special precautions need be taken to obtain the crude desired. In some instances, special crudes have been transported via tank car to keep this supply separate for lubricating oil manufacture.

In most cases, when more than one crude is used in a single plant, a consignment of the lubricant crude is pumped through the pipeline, to the exclusion of all other crudes during that period, and the crude is segregated in separate storage tanks at the plant, topped in stills without admixture with other crudes, and the lubricant fractions distilled in separate stills. In general the matter of keeping lubricant crudes separate from others presents no difficulty.

In 1932, these 18 refineries produced 2,879,000 barrels of lubricating oils of all classes, as compared to 22,396,000 barrels produced by the entire U. S. industry. Figures for the different classes of lubricants are not segregated by statistical organizations. As to future supply of such crudes, probably the largest at present is the Oklahoma City field, the supply from which may be expected to

J. F. M. Taylor, manager lubricating oil department, Shell Petroleum Corp., St. Louis.

be adequate for all lubricant refiners for several years to come, even if no other crudes are used for this purpose, or if other sources should fail.

After completion of the modern refining process, whatever the individual details may be that each Mid-Continent refiner employs, the various finished oils may be sold directly as lubricating oils, or may be blended in various proportions to obtain the different viscosity ranges for the innumerable uses for which they are employed. Practical considerations make it necessary to blend many oils, as separation into so many fractions at the plant is not feasible if cost is to be held low. Bright stock, also made by filtration, or acid treatment, solvent action or combination of these, is blended with various neutral oils to produce the different classes and grades.

Several of the refiners making lubricating oil also produce a complete line of compounded lubricants. In addition, three or four organizations, not refiners themselves, specialize in making greases and oils for the marketer who does not produce his own lubricants. The technology of, especially, grease-making is highly developed, requires considerable skill and wide experience in practice; it is in fact a technical industry in itself, and can be handled successfully only by well trained technical operators.

W. M. Harrison, president, Star Refining & Producing Co., Fort Worth

IT'S ONLY HORSE SENSE TO BACK THIS WINNER—

Mobilgas

with

CLIMATIC CONTROL

Alert distributors will appreciate the advantages of this *national* brand gasoline—MOBILGAS! Its increased local prestige and wider popular appeal mean increased sales . . . And Mobilgas is the only gasoline with Climatic Control—a feature which is placing it in the lead—both in popularity and performance! We offer jobbers in White Eagle territory a most valuable franchise. Wire or write immediately for our attractive proposition.

WHITE EAGLE OIL CORPORATION
A Socony-Vacuum Company
KANSAS CITY, MO.

TURN to the classified advertising page near the back of this issue. You will find some interesting items there • • • • • • •

Natural Gasoline is Important Mid-Continent Product

TULSA

NATURAL gasoline, the production of which dates back more than two decades in the Mid-Continent, has been for a great part of this period one of the major products, in quantity and utility, of the entire oil and gas industry. This is true at present, and may be expected to be as long as gas and petroleum are produced.

The Mid-Continent is second in output of the three major natural producing areas—California, Mid-Continent, Pennsylvania—and supplies natural gasoline to the entire area of the United States between the two major mountain areas. Produced first chiefly because of the difficulties arising from its condensation in gas lines, it has come to be an indispensable product as a constituent in motor fuels, and its production is a necessity as a conservation measure as well.

Its economic importance is indicated by the fact that, in 1931, the natural gasoline produced in the Mid-Continent was 22 per cent of the refinery gasoline produced and practically all the natural was blended into the finished motor fuel.

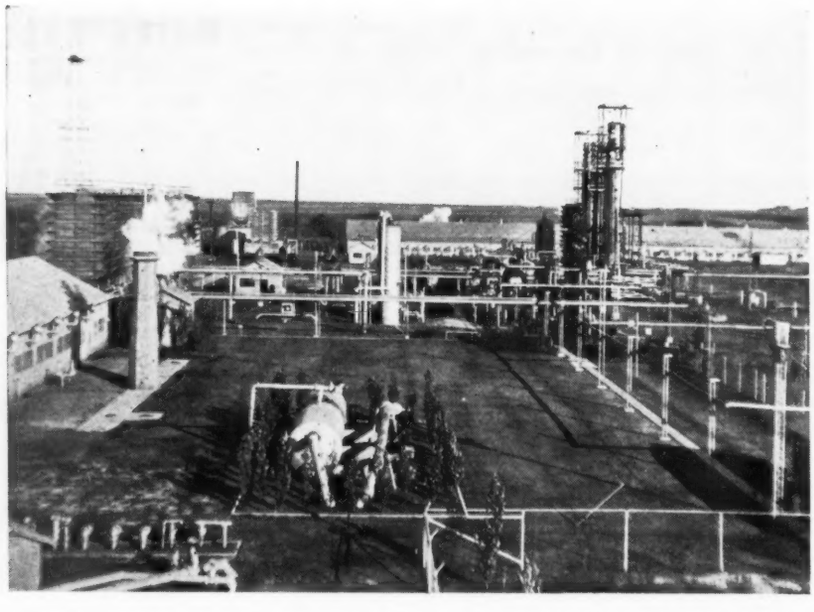
Its present position is that of a commodity which, for a large number of cogent reasons, will be, and must be produced. It will be produced because of its evident desirable properties as a motor fuel constituent, and for other purposes such as aviation fuel, special naphthas and solvents, etc.

At present the gasoline manufacturer has five major outlets for his product; (1) blending of usually relatively high vapor pressure material at refineries or bulk stations into finished motor fuels; (2) sale to jobbers, etc., for direct blending for motor fuel, with heavier naphtha obtained from refiners, similar to (1); (3) Careful stabilization to low vapor pressures, and sale as motor fuel direct; (4) manufacture of special naphthas, solvents, etc., for the industrial trade; and (5) segregation by fractionation and stabilization to produce different hydrocarbons and mixtures of these and sale as liquefied or "bottled" gas, for retail and industrial consumption, in homes, business houses, enrichment of commercial gas, etc.

At present all five channels of disposal are in use, the greater portion being sent to refineries as has been the case throughout the history of the industry.

The trend at present, under existing prices for refinery and natural gasoline products, is toward the disposal of a larger and larger proportion of stabilized natural direct to consumer or to the marketer who sells again to the consumer at retail. This is caused by the increase in the amount of light recovery gasoline made in refineries.

The increase in production of refinery vapor recovery gasoline caused natural gasoline manufacturers to improve their product through stabilization. With this process manufacturers were able to economically produce gasolines which would not cause vapor lock in the au-



Phillips Petroleum Co. gasoline plant in the Oklahoma City field. This plant has a capacity of about 1,000,000 cubic feet of gas per day

Table 1

Natural Gasoline Production, in the U. S. and in the Mid-Continent, 1911-1932

Year	Production in Thousands of Gallons U. S.	Mid-Continent
1911	7,425	388
1912	12,081	1,576
1913	24,060	6,463
1914	42,652	17,278
1915	65,364	31,666
1916	103,492	52,980
1917	217,884	128,199
1918	282,535	180,438
1919	351,535	212,678
1920	384,743	226,754
1921	473,658	281,409
1922	505,848	321,360
1923	816,228	513,692
1924	933,870	564,922
1925	1,004,894	653,300
1926	1,356,800	811,000
1927	1,623,600	977,000
1928	1,777,700	1,071,000
1929	2,195,400	1,228,300
1930	2,210,500	1,221,900
1931	1,831,900	998,600
1932	1,502,424	820,600

*Oklahoma was the only state in the Mid-Continent reporting natural gasoline production during these years.

Table 2

Natural Gasoline Plants, Mid-Continent, and Rated Daily Capacity. (1932)

State	No. plants	Capacity, gals./day
Arkansas	14	103,000
Kansas	20	203,000
Louisiana	50	477,000
Oklahoma	238	3,189,000
Texas (Excluding Gulf Coast)	128	2,411,000
Total	450	6,383,000

tomobile and which could be handled at the refinery or shipped into export channels without large losses.

As a by-product of stabilization a new industry has arisen—the liquefied gas industry. Propane is being marketed in steel bottles for domestic gas use in communities far removed from natural or artificial gas mains. Butane is finding many uses for gas enrichment, small town gas plants, and for certain heating operations where close control of temperatures and a pure flame are necessary such as in the ceramic and automobile industries.

Table 3

Liquefied Gases Marketed in the U. S., and Growth of Number of Customers

(From U. S. Bur. of Mines Reports)

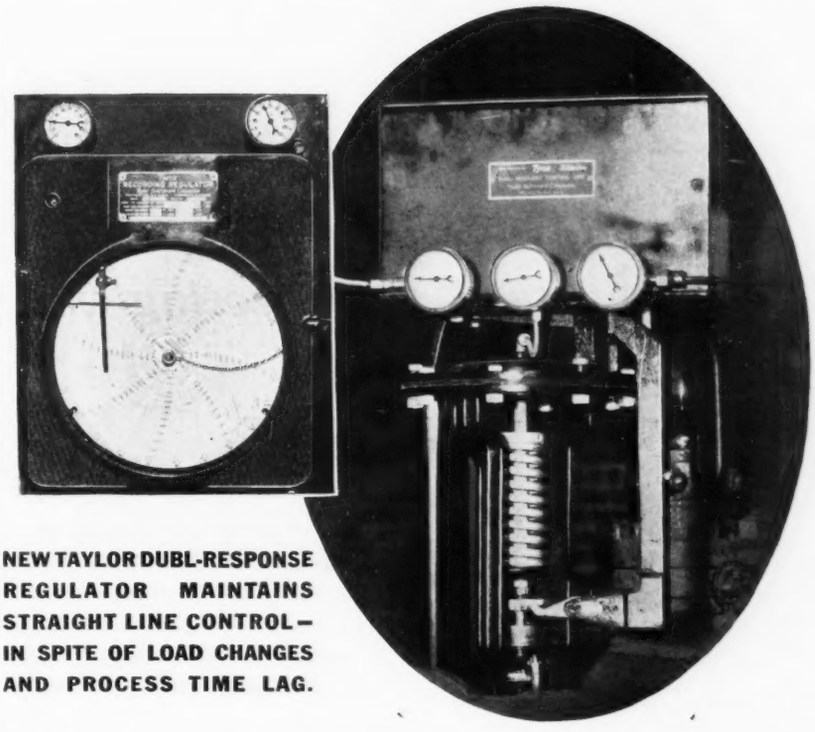
	Sales Gals.	No. Retail Customers
1922	226,641	.....
1923	276,863	.....
1924	376,488	.....
1925	403,674	.....
1926	465,085	.....
1927	1,091,005	.....
1928	4,522,899	20,000
1929	9,930,964	55,000
1930	18,017,347	117,000
1931	28,502,819	150,000
1932	33,630,236	167,000

NEW YORK, May 13.—Erie Steel Barrel Co. announces the appointment of Lydecker and Hood, 11 Broadway, New York City, as sales representative in the New York territory.

LARNED, Kans. — F. P. Lanahan, of Salina, is building a 200-barrel skimming plant here. It is scheduled to be operating by May 15. The crude supply will be obtained from fields in western Kansas.

Oil companies prove value of

NEW TEMPERATURE CONTROL



NEW TAYLOR DUBL-RESPONSE REGULATOR MAINTAINS STRAIGHT LINE CONTROL—IN SPITE OF LOAD CHANGES AND PROCESS TIME LAG.

TAYLOR presents a new instrument development in its Dubl-Response Regulator. This new unit, used with Taylor Recording Regulators and Evenaction Diaphragm Valves, overcomes stuffing-box friction and eliminates "sticky valve" troubles.

This instrument has proved its value on important installations. On the Pacific Coast a prominent oil company tested the Taylor Dubl-Response Regulator on the most difficult control job in one of its plants; namely, the fractionating tower top temperature of the pressure stills, requiring 4,000 to 9,000 gallons of reflux an hour depending upon the load. Previous operation of the tower had been a combination of automatic and hand control—sending a good portion of the reflux through a by-pass. The Dubl-Response Regulator took full control. The by-pass was closed. The results were so satisfactory, five more units were immediately ordered by this same oil company.

Let us tell you more and send you a new bulletin giving facts about the operation of this new development for the petroleum industry. Write to Taylor Instrument Companies, Rochester, N. Y.

Tycos Taylor

Indicating · Recording · Controlling

TEMPERATURE *and* PRESSURE INSTRUMENTS

*The name Taylor now identifies our complete line of products, including Tycos instruments.

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Oil Price Handbook for 1932, 1931, 1930 or 1929 ..... $7.50
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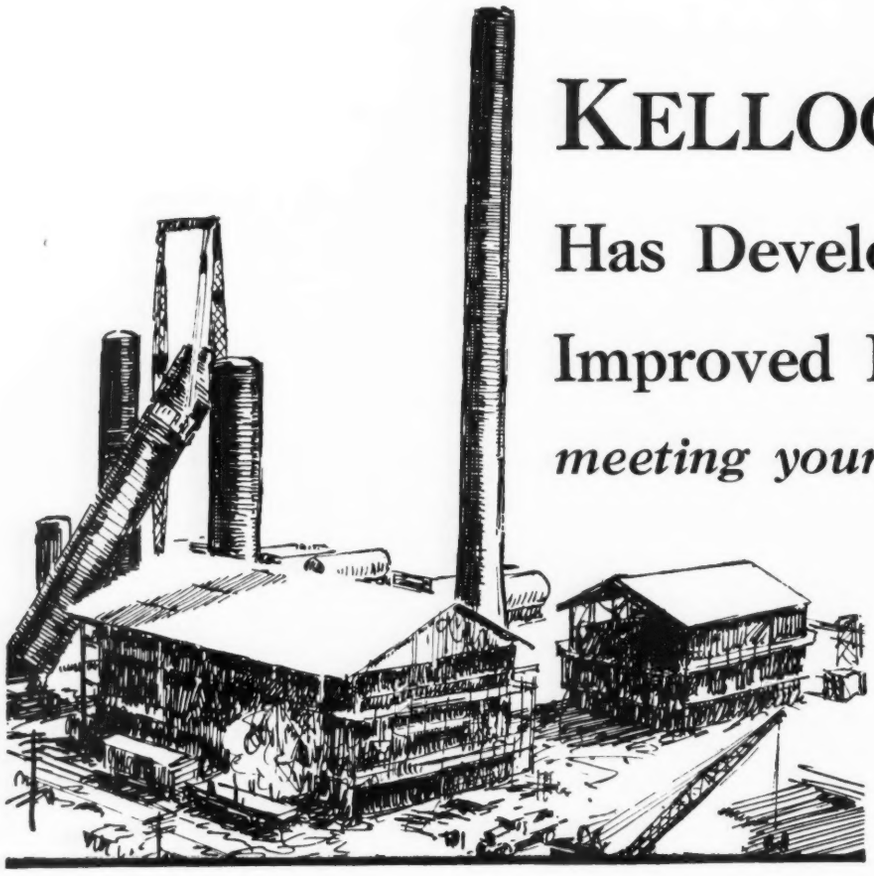
National Petroleum News, 735 Penton Bldg., Cleveland, Ohio



KELLOGG

Has Developed Improved Methods *for meeting your plant problems*

THE advance in methods of processing has been so rapid that most refinery equipment becomes obsolete before it is worn out.

In many cases such equipment can be adapted to other methods, and whole units can be efficiently rebuilt for greater capacity, more economical operation, and the making of more valuable products.

Under present conditions, obsolete equipment must be rebuilt or replaced with more efficient units if the refiner is to make a profit. Now is the time when such projects can be carried out at low cost.

Licensing Agent for Gasoline Products Company, Inc.

Licenses granted under United States and Foreign Patents for: Cross • de Florez • Holmes-Manley • Tube and Tank Cracking Processes and Combination Cracking Units.

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K E L L O G G

Kellogg products include Cross, Holmes-Manley, deFlorez and Tube and Tank cracking units, absorption plants and pipe stills. Pressure vessels for the Power, Refinery and Chemical Industries. Power plant and Industrial piping. Pacific Hot Oil Pumps, Radial brick chimneys. Plastic Refractories.

Many and Varied Specialty Products

As Well as Gasoline, Motor Oil, Etc.

Produced at Mid-Continent Refineries

By Arch L. Foster
N. P. N. Staff Writer

TO ENUMERATE the petroleum products made from Mid-Continent crude is to catalog practically every type of petroleum product made in the U. S.

The major portion of all petroleum products are included in three main classes; light distillates, as gasolines and naphthas; lubricants; and heavy residuals, such as fuel and road oils. Specialties such as sprays, medicinal oils, solvents, industrial oils are derived from one or more of these classes, with or without the addition of non-petroleum materials.

From Mid-Continent crudes are manufactured the following typical light products:

Motor fuels
Kerosine and illuminants
Solvents, diluents
Synthetic alcohols
Non-condensable gases
Tractor fuels
Special naphthas

Table 1

Production of the Major Petroleum Products in the U. S. and Mid-Continent, 1932

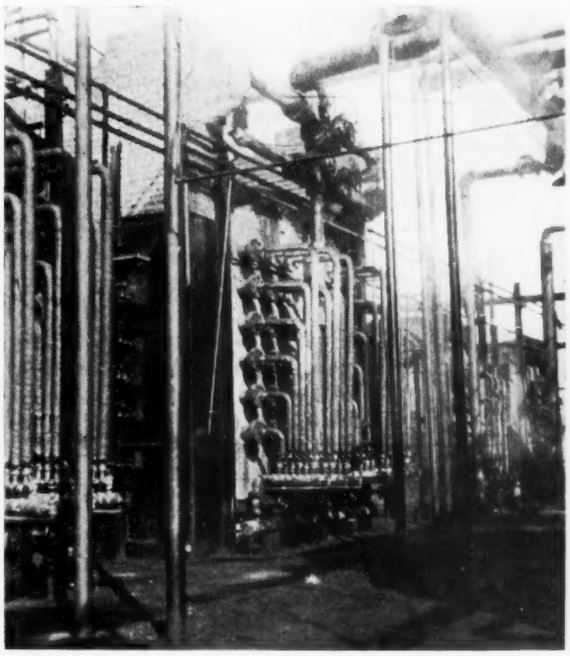
Product	U. S.	Mid-Continent
Gasoline bbls.	391,099,000	87,822,000
Kerosine bbls.	43,836,000	9,593,000
Gas Oil bbls.	69,407,000	11,191,000
Fuel, Residual bbls.	224,085,000	38,361,000
Lubricants bbls.	22,396,000	2,879,000
Paraffin Wax lbs.	458,920,000	31,920,000
Coke, tons	1,788,800	326,900
Asphalt, tons	2,409,000	93,400
Road Oils	6,879,000	1,448,000

Alcohol, benzol and turpentine substitutes.

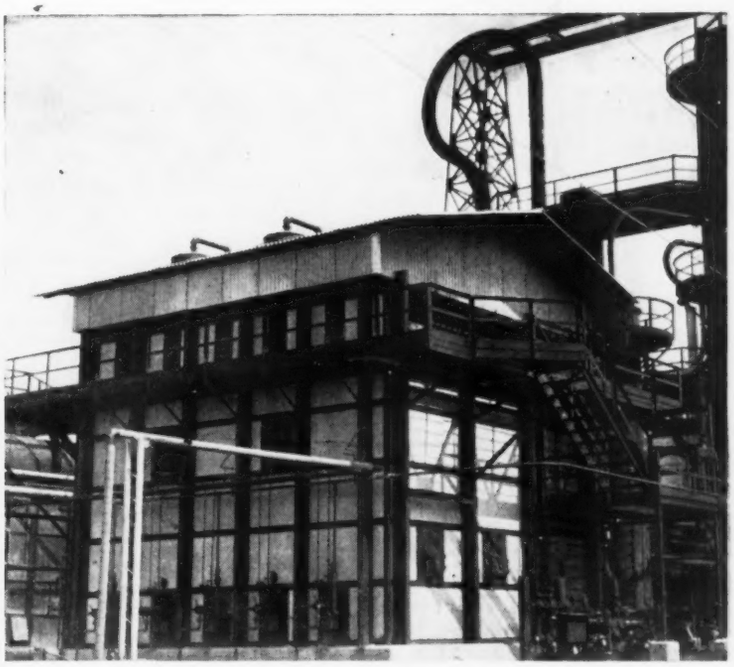
Chemical intermediates.

Motor fuels are so well known as to their chief specifications that little need be said regarding them. Because of the large production of natural and refinery recovery gasoline, volatility has been and is high in gasolines from this area, a relatively large proportion of light naphtha being employed in blending. Cracking plants are installed in 63 refineries in the Mid-Continent, with a total estimated capacity of 320,000 barrels per day.

Detailed figures for octane ratings on Mid-Continent gasolines are not available; investigations of private companies indicate, however, that the average rating for "regular" or



Forerunner of the modern pipe still. An old header-type pipe still at the Barnsdall refinery, about 1925



A modern pipe still of the type now being built at Mid-Continent refineries

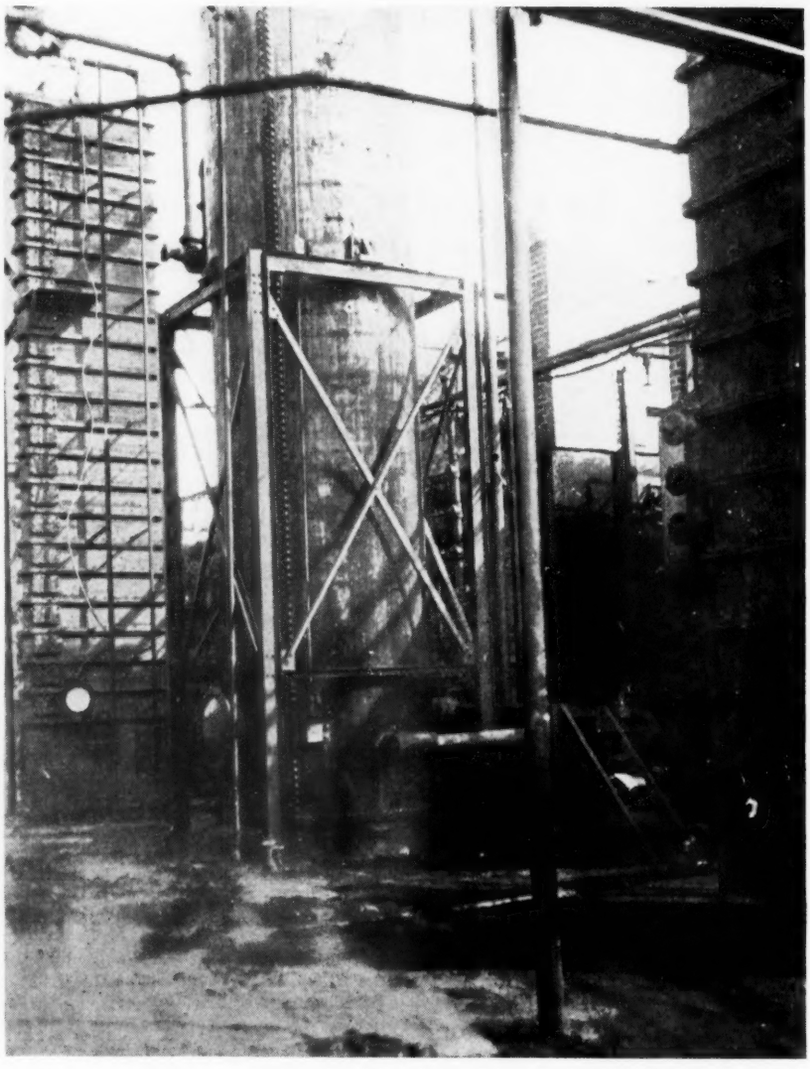
house-brand gasolines during the winter of 1932-33 was approximately 61 octane number, by the new or motor test method. Table 1 shows the rating of 108 samples of commercial gasoline sold in the Mid-Continent trade area during the period Dec. 1932-March 1933. Total production of motor fuels in the Mid-Continent for 1932 reported by the Bureau of Mines was 87,822,000 barrels, which included an indeterminate amount of special naphthas.

Kerosine production during 1932 is reported as 9,593,000 barrels, the greater portion of which was of course for home lighting. The specifications of the kerosine produced vary with the production of other products such as tractor fuels, and with the amount of re-forming and light distillate cracking done during any period.

Tractor fuels may vary widely in specifications, from a heavy gasoline cut to a kerosine of average specifications; the tractor fuel production may thus affect the quantities of both heavy blending naphtha and kerosine produced, depending on the market price for these products.

Special naphthas include all light distillates for any purpose other than fuel use. Statistics on their production and consumption are not available. For cleaners' naphtha a typical specification is: Gravity, A. P. I., 48-50; 250-60 F. initial boiling point and 375 F. end point. Stoddard solvent, for use in dry cleaning for a minimum fire hazard, usually has about the same gravity as cleaners' naphtha, with a 300-10 F. initial, and 410 F. end point, being a distillate of a more narrow and higher temperature range than the naphtha.

Paint thinners, such as varnish makers and painters naphtha, turpentine substitute or mineral spirits, are used to replace turpentine in paints. A typical specification for V. M. & P. naphtha is: A. P. I. gravity, 58-60; initial, 200-10 F., and end point 310 F. This is somewhat higher volatility than that of turpentine, which, however, does not have so wide a distillation range, the greater portion of good turpentine boiling around 320 F.



Forerunner of the modern fractionating column. These bubble towers were "borrowed" from the benzol industry and transplanted in the Mid-Continent to fractionate petroleum distillates at the Barnsdall refinery about a decade ago

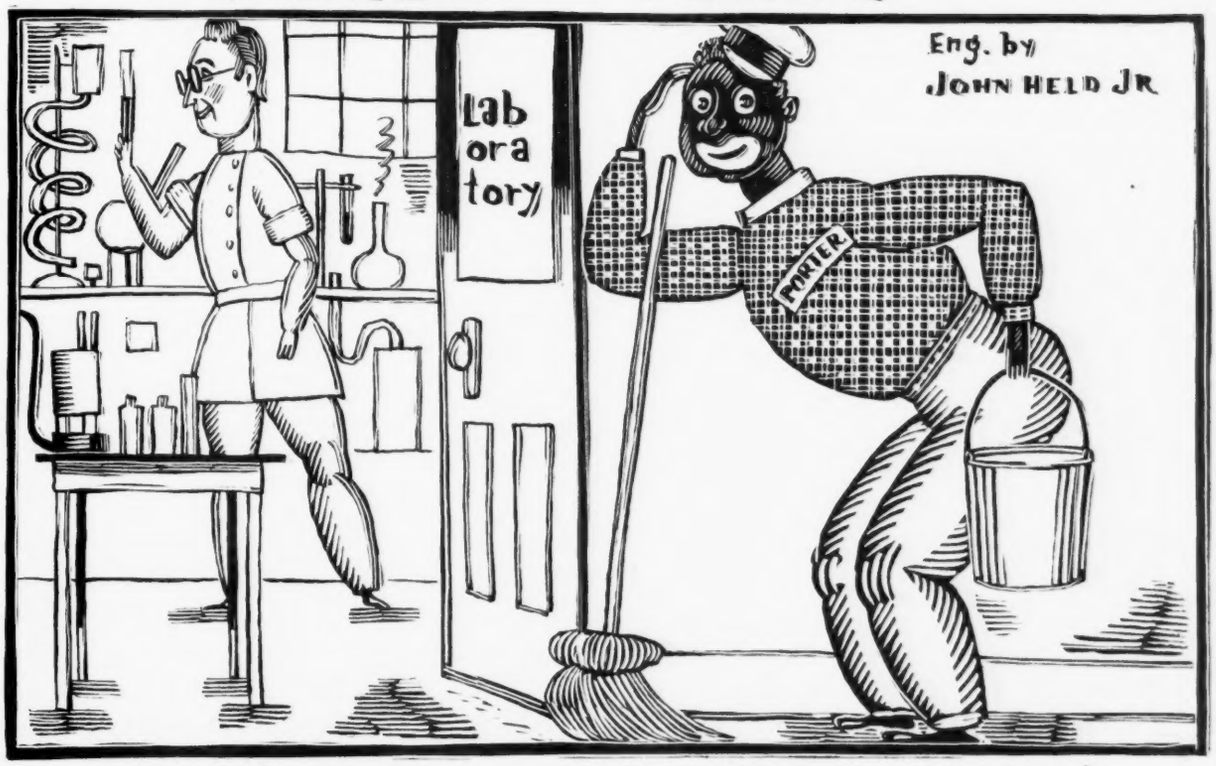
Rubber solvents are used widely to supplant more expensive benzol, and other products in the rubber industry. Volatility varies for specific purposes, the more expensive being those most closely fractionated. The cheapest and most common solvent may range from initial of 110 F. to 275 F., with a price only a little higher than motor gasoline. More special, and expensive solvents, for definite purposes, may have as narrow a range as 140 F. to 200 F., or even 140 F. to 180 F., and other specifications also narrow to suit the ideas and needs of the individual rubber manufacturer.

Complete removal of the solvent, or the retaining of only a definite small portion of solvent in the finished rubber is the prime requirement for such solvents. Freedom from sulfur and other deleterious impurities which might affect the durability and odor of the material is also another important requirement.

Synthesis of alcohols from refinery and natural gases has been carried out for some time in the Mid-Continent refining area, producing mainly propyl, iso-propyl, butyl, amyl, and "mixed" alcohol. These products are used mainly by the lacquer industry, and also by the cosmetics, perfume, and dye industries.

Two methods are employed in alcohol manufacture, one by the oxidation of hydrocarbon gases, the other by formation of inorganic esters and subse-

GREASE AINT



JES' GREASE NO MO'

"Out of the mouths of babes came forth wisdom."

When Porter Joe made the remark that "Grease ain't jes grease no mo" he spoke a mouth full.

Recent articles on Lubrication imply that automotive engineering cannot proceed further until there is a universal supply of modern lubricants readily available by the automobile owners. Actual happenings demonstrate definite cases.

Case One—A new car lubricated with old type grease runs 281 miles and comes back with hypoid gears wrecked.

All this points to the fact that the modern service station must have modern greases and lubricants in order to keep up with today's requirements and continue in business.

Our Laboratories have perfected the following greases and lubricants . . .

Extreme Pressure Lubricants for differentials,

Semi-Fluid lubricants for "Tryon" threaded bolt and silent "U" shackles,

Pressure gun greases for chassis, wheel bearing, water pump and universal joint lubrication.

Send for prices . . . test figures . . . merchandising plans.

Manufacturers of Automotive, Industrial and Marine Grease of high quality and uniformity. Industrial Oils, Midcontinent Motor Oils, and 100% Pure Pennsylvania Motor Oils.

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QUALITY I SERVICE L C AROUND THE WORLD

COMPLETE EXPORT FACILITIES

International Lubricant Corporation

NEW ORLEANS LOUISIANA

Airplane view of Ponca City refinery of Continental Oil Co., at right, and partial view of Empire Oil & Refining Co. plant at left of railroad tracks

quent hydrolysis of these to form the corresponding alcohols. One plant operating by each method has been in operation, the one employing the esterification-hydrolysis process having recently been consolidated with a similar process of the Standard Oil Co. of New Jersey into one company, which is now operating a consolidated plant in New Jersey.

Production of benzol and similar hydrocarbons, for use both as chemical intermediates for manufacturing various chemicals, and as a component of high anti-knock motor fuels, is accomplished in various ways, and processes are at present mainly in the experimental stage.

Decomposition by heat and pressure is one of the methods employed, with or without oxidation, several oil companies having spent considerable effort in developing processes. The U. S. Bureau of Mines, at Bartlesville, Okla., has investigated the method of heat decomposition of natural gas to produce benzol and aromatic hydrocarbons, and the initial results prompted further study on a larger scale, the results of which are not yet complete.

Motor lubricants from Mid-Continent crudes are made, as is the case in first-class refining processes throughout the country, by vacuum or steam distillation; paraffin wax removal being by press or centrifuge or both. Acid or other chemical treatment and/or filtration is carried on to bring desired color, carbon residue, emulsification, and other specifications.

Engine, turbine and steam cylinder oils make up the bulk of the total lubricant production. The wide variety of special and lesser known lubricants made will be given more detailed attention later in this article.

Diesel engine oils are normally a blend of bright stock and a lighter neutral oil. Aviation oil requirements are very strict as to flash, low cold test, and carbon residue requirements and frequently are "straight cuts." Ice machine oils have a very low cold test, minus 35 to minus 40 F., and are made by thoroughly dewaxing, usually by centrifuge, neutral oils of the desired viscosity.

Floor oils are produced, by adding a deodorant or an odorant to a neutral oil, the viscosity of the latter varying for

Table 2

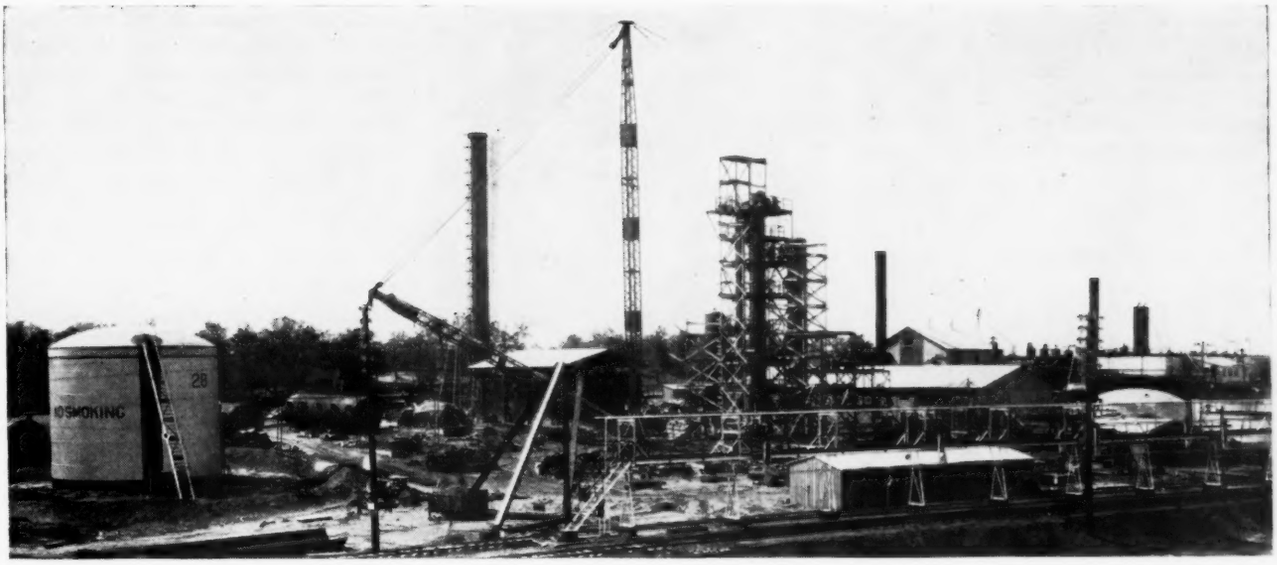
Octane Numbers of Motor Fuels
From Mid-Continent Crude, Dec. 1932—Mar. 1933
(By C. F. R. Motor Method)

REGULAR OR "HOUSE BRAND" GASOLINES

OKLAHOMA		KANSAS		TEXAS		MISSOURI		ILLINOIS	
Sample No.	Octane No.	Sample No.	Octane No.	Sample No.	Octane No.	Sample No.	Octane No.	Sample No.	Octane No.
562	64.0	701	63.0	879	61.0	536	63.0	478	65.0
417	64.0	420	61.0	447	60.3	752	62.4	787	64.0
698	63.5	027	58.0	083	58.0	709	61.0	729	61.4
845	62.0	562	61.0	712	60.3	443	59.5	014	61.4
225	64.0	333	60.6	210	62.2	004	59.5	017	60.3
132	62.6	199	60.0	376	62.0	343	63.0	024	59.5
024	62.4	541	60.0	139	61.2	190	63.7	111	75.0
315	62.2	286	64.0	37	59.7	391	65.3	117	71.0
722	61.4	931	63.0	121	59.2	1215	65.3	302	67.0
397	61.0	518	58.6	257	56.4	419	62.2	593	66.7
694	58.4	637	58.0	283	56.4	102	54.6	489	66.0
317	56.0	311	62.0	172	60.3	372	61.0	721	65.5
Average	61.8		60.8		59.8		61.5		65.2

THIRD GRADE GASOLINES

238	53.0	614	44.8	018	49.7	104	48.9	390	54.1
590	44.7	307	51.5	076	49.7	373	51.2	103	51.2
517	49.9	836	52.6	053	46.6	613	45.8	712	46.5
729	46.1	116	50.5	031	46.3	572	48.8	883	51.9
386	49.2	278	51.2	022	51.3	511	50.9	617	48.5
539	47.6	255	48.2	088	43.1	926	46.3	385	49.2
193	53.0	302	47.4	090	50.5	281	49.7	914	68.7
275	50.2	184	52.6	027	43.1	447	57.7	822	47.9
756	51.7	...	....	064	48.8	864	51.4	548	52.5
357	48.8	...	....	071	48.5	228	53.7	119	49.7
Average	49.4		49.8		47.8		50.4		52.0



One of the new cracking units being built by Marathon Oil Co. at Bristow, Okla.; a similar unit also under construction at the company's Ft. Worth, Texas, refinery. These units are of the combination furnace, viscosity breaker-vapor-phase cracking type, two units of the heating system being housed in the same large furnace body. One side of the furnace is the viscosity-breaker, the opposite side is the vapor phase cracker. Both convection banks are in the middle of the furnace, with a bridge wall on each side. These units are expected to be ready for trial runs about June 1

the specific purpose of the oil. Cream separator oils are made by blending neutrals to the series of viscosities desired by the trade and are of normally low cold test. Flushing oils are neutrals of the extra light, S. A. E. 10 viscosity range; they are less used now than formerly, because of the wider use of filters and purifiers for crankcase oils on automotive engines.

Cutting oils for cooling and lubricating cutting tools are emulsions of neutral and lard oils, either natural lard oil or the substitute made from viscogen and red oil. Viscogen is the calcium salt of sacharic acid. This acid is prepared by oxidation, with nitric acid, of cane sugar, starches, etc. Soluble oils are a combination of neutrals which may be emulsified in water by means of a soap or similar emulsifying agent.

Edward T. Moore, president Simms Oil Co., Dallas

Harness oils, produced in relatively great quantity in the Mid-Continent because of the large agricultural areas in and adjacent thereto, are mixtures of neutral oils and a small percentage of neatsfoot oil. Natural neatsfoot oil is made by boiling down the feet of cattle and sheep, and contains oleic, palmitic, and stearic acids, and some glycerol. The substitute is made by mixing fish oil and neutral petroleum oil.

Transmission oils are made from heavy residual oils, with or without addition of soaps. Extreme pressure lubricants are made from approximately the same oils, with the addition of lead soaps, substances containing chlorine, sulfur, or a combination of two or three of these materials.

Penetrating oils are made by "cutting" a neutral with a distillate of the kerosine type. This low viscosity enables the oil to penetrate narrow interstices between springs, the light distillate evaporating and leaving the heavier oil to do its work of lubrication.

Chassis oils are neutrals combined with an odorant, the latter being employed to avoid the presence of objectionable petroleum odors especially in warm weather. Oil of wintergreen, citronella, and other "essential oils," or synthetic oils such as oil of mirbane (nitrobenzene), are used for this purpose.

Household oils are neutrals of the 60 to 100 viscosity (at 100 F.) range, with an odorant. Often extreme care is taken to completely neutralize these oils,

C. L. Henderson, vice-president, Vickers Petroleum Co., Wichita, Kan.

to insure freedom from corrosive acid impurities.

Furniture polishes are made from neutral oil, with pine or some similar oil as an odorant, with sufficient light naphtha, such as Stoddard Solvent, to reduce viscosity; sometimes a slight amount of animal, vegetable or paraffin wax may be added.

Shock absorber oil may be made from neutral, with a large percentage of glycerine, some butyl or amyl alcohol. Core oil, used in foundry practice, is normally a fuel oil of 20 A. P. I. gravity or above, combined with some kerosine, rosin and/or linseed oils. Core oil must be free from moisture because of the high temperatures encountered.

Of the greases, five grades of cup grease are customarily made. They combine neutral oil of usually 200 or 300 viscosity, with varying percentages of a soap or soaps made from soda or lime, and tallow or corn oil or other saponifiable fatty oil, soap content determining the consistency.

Roller bearing and gear greases are made from cup grease ingredients, as is wheel bearing grease, with the addition, frequently, of tallow or tallow oil. Black, residual oils, reduced to the desired high viscosity, are employed for rock bit, track and curve lubricants.

Axle grease is similar to cup grease, except the oil is not well refined, and rosin oil is the saponifiable agent. Sometimes

W. L. Scott, sales manager, Wirt Franklin Petroleum Corp., Ardmore, Okla.

W. E. Moody, vice-president in charge of refining, Deep Rock Oil Corp., Cushing, Okla.

powdered graphite is added to axle greases.

Space is available to refer to only the major specialties manufactured from Mid-Continent petroleum products. Among these may be mentioned sprays and insecticides; white or medicinal oils; petroleum derivatives; and wood preservatives.

Insecticides include cattle and plant sprays, fly sprays for home and barnyard. For barnyard or outdoor use, a concentrated extract of the dried flowers of the pyrethrum plant, 2-10 per cent of neutral oil, and the remainder of kerosine is used. For use in dwellings, pyrethrum extract, diluted with a large per cent of cleaners' naphtha, is employed. Pyrethrum extract in kerosine, with small additions of pine oil, wool fat, degras, or fish oil is used, the latter oils being used to give clinging power as well as a covering coat.

Plant sprays are made with or without the use of pyrethrum extract, and with varying percentages of degras or horse fat, wool fat, pine oil, kerosine or neutral oils, emulsified, for immediate use, in water.

Wood preservative and lice killers are made of the drip from artificial gas plants, containing aromatic heavy oils of the coal tar type, with or without the addition of medium heavy or light diluents from petroleum.

Nicotine-bearing sprays are also widely used, especially in California and other fruit-growing areas. Very light neutrals are also used, of viscosities of 60-80 seconds Saybolt. Authorities report that, with oils above 100 seconds viscosity, toxicity decreases. Nicotine is especially effective on fruit scale, a spray of two per cent of an oil containing 0.01 per cent of nicotine sulfate showing 93 per cent toxicity on scale. Other materials which are used in kerosine for sprays are pine tar oils, p-dichloro-benzene, and soluble dyes.

Medicinal oils are medium to light viscosity, refined until essentially colorless, tasteless and odorless by the use of filtration and acid treatment. In addition to therapeutic uses, these oils enter into the manufacture of various "beauty" creams and ointments, face and cold creams, skin lotions, headache remedies with oil as the carrier of the active drug; in insect creams, which are composed of white oil, a cream and a repellent.

Petrolatum (trade name "vaseline") also enters into the manufacture of creams and ointments, the making of smokeless powder and other explosives, in salves and semi-solid medicaments of a wide variety of types and uses too numerous to outline here.

Practically all the petrolatum of commerce comes from Pennsylvania and the Mid-Continent and is produced either from the centrifuge or the cold pressing of lubricating distillates and residuals. Fresh fruits are also

C. W. Cahoon, Jr., vice-president and sales manager, Taylor Refining Co., Tyler, Tex.

coated with petrolatum as a preserving coating.

Paraffin wax is composed of high melting point, high molecular weight hydrocarbons of the paraffin series obtained from lubricant fractions by pressing in the cold. It finds wide application in match and candle manufacture, in leather, floor and furniture polishes, in coating and impregnating paper and cloth for waterproofing; in the making of roofing and wrapping materials, and hundreds of other uses. For instance, paraffin enters into the production of the huge quantities of paper used to protect the pineapple fields in Hawaii.

Coke is the end product of destructive distillation of heavy fractions, as in cracking, and coking of heavy residuals. Used mostly as a fuel, it finds also some use as carbon electrodes and similar applications. Recent developments in coking, such as the Knowles oven, are producing a better household and industrial fuel from heavy oils, both in the Mid-Continent and in the east.

Road oils are made in at least six refineries in the Mid-Continent, and in 1932, 1,448,000 barrels of such oils were produced in this area. Specifications for road oil vary widely, and most refiners who make it are equipped with vacuum reducing units and have great flexibility in meeting these variations from different localities.

Space is not available to outline many other specialties produced in the Mid-Continent, such as cable and wire rope lubricants, hot neck, roll and similar lubricants for the steel and metal industries; locomotive journal greases, car oils, switch oils; signal and lighthouse oils and illuminants; silk wool, rayon and spindle oils for the textile industry which must be light, nearly colorless, odorless, and free of impurities harmful to textiles. Rust removers, rust preventatives, protective coatings for pipelines, and underground metal materials—literally hundreds of other special materials—are produced and used either "as is," or as intermediate and raw materials for a large portion of the present-day industrial and commercial products.

Kansas Begins War on Bootleggers With New Trucking Rules

SOUTH HAVEN, Kans. THE war is on in Kansas. Gasoline bootleggers who have been merrily jumping the state boundaries for the past two years are being stopped at the border. The new tax evasion law became effective May 1, and the state inspectors at the various ports of entry are briskly registering every truck load of motor fuels coming into the state.

Briefly, this law calls for liquid fuel carrier's license, surety bond of $1000, liability insurance and permit to operate for each truck operator. All vehicles must be labelled, front and rear, with the word "Gasoline" and the name of the owner and his license number.

Ports of entry are set up along all state borders where all trucks entering or leaving the state must stop for inspection and to obtain clearance certificates to proceed into or across the state. All truck drivers must have in their possession at all times a bill of lading for their loads and their permits to operate and must travel over prescribed routes.

The first seven days of inspection and registration on the borders are passed and the activities have been considerably below the expected par. There are several factors which may account for the slowness of trade. It is believed that many truck transporters, legitimate and otherwise, have not yet obtained their hauling permits from the state and are awaiting their receipt before resuming operations.

L. B. Simmons, president, Rock Island Refining Co., Duncan, Okla.

Another reason, for which there is an abundance of proof, is that in the week or 10 days preceding the advent of the new law inter-state truck shipments reached an all time peak. Through the little town of South Haven, which is one of the principal new ports of entry along the south line, there was an average of 16 trucks per night during the last week in April. There has not been a night load through the town since then. Day time shipments were in proportion according to reports from other ports bordering Oklahoma.

Inspections during the first week of May at South Haven totaled only about 45,000 gallons and it was doubtful if the whole south boundary would pass more than 75,000 gallons during the same period. This is thought to be not more than 30 per cent of the usual traffic.

It seems that many a Kansas dealer and distributor was laying in a supply ahead of the deadline. Paying the tax anytime is going to come hard with some of these dealers after a year or so of price advantage through non-payment, but to conform with the law abruptly would be too much of a shock and the laid-in supplies are to be used to taper off gradually into good citizenship.

That most of the dealers are to be made into good citizens as far as gasoline taxes are concerned is evidenced by the type of men chosen to enforce the

Getting the low down on a large semi-trailer on the Kansas border. An inspector taking down the required information for his report and giving the driver instructions on his route

law. There is a noticeable lack of the usual professional office-holders in the group of 130 men who are filling the inspection positions. Though the salaries paid are but little more than good wages, the general depression made possible the selection of high caliber men, many of whom are occupied with professions of their own during normal times.

These men find their present occupation interesting and are, as one dealer expressed it, "Plenty serious in their intentions." They are extending their purely inspection duties at the ports by scouting portions of the interior where there is reason to question the operations of local distributors. These journeys include night checking of suspicious areas, and it is already indicated that some interesting reports will result.

Aside from the inspectors at the designated ports of entry, there are also a number of roving assignments. There are six of these mobile checking units along the Oklahoma line and like most of 39 the stationary inspection points around the state they are on duty 24 hours a day. The men have regular routes which they must cover during their tour of duty but there is plenty of time to watch all other roads over which gasoline trucks might seek to enter the state.

The duties of the port inspectors are numerous and each is equipped with police power to be used in search and seizure or the arrest of violators should occasion demand. The inspection of a load of motor fuels consists of taking quart samples from each tank compartment and then sealing all openings. Some of the larger loads require as many as 12 metal seals. These seals are not to be broken except at the destination specified in the bill of lading carried by the driver or, in case the load is crossing the state, at the port of exit.

The sample cans are labeled the location at which the sample was taken, the kind of fuel it contains, the size of the whole load, the refiner, point of origin carrier, license numbers, the consignee and destination. These cans are then forwarded with the daily report of the inspector to state headquarters at Topeka, Kans.

These reports include such information as consignee and consignor, character of fuels and vehicle, origin and destination, and the make, engine number and license number of the truck. Routes of travel over which the load must travel are also outlined by the inspector in the report and the driver risks confiscation of his truck and arrest if he uses any other roads,

When all the above has been done and the load has been found in good order, a clearance certificate price 50 cents, is issued to the driver which carries much the same information. The stubs of these certificates with the various seal numbers makes up an office record of the transaction.

Wirt Franklin, president, Wirt Franklin Petroleum Corp., Oklahoma City and Ardmore, Okla.

Pure Oil Guarantees Yale Tires For One Year

CHICAGO, April 29.—Following consultation with all tire companies and exhaustive study of marketing experiences with all brands of tires and tubes, The Pure Oil Co. has taken on the sale of a complete line of Yale tires and tubes made by the General Tire & Rubber Co., Akron, O. This brand was the same as formerly marketed in Pure Oil territory by the manufacturer itself, and is not a private brand of the oil company.

Tires will be handled at all company stations and through its dealers. They are guaranteed doubly, both by the manufacturer and by the Pure Oil for one year, according to the May issue of Purol Globe, dealer publication of the Pure company.

Should a tire fail in service, the customer can take it to any Pure Oil dealer handling these tires, and receive an adjustment. For each month short of the year that the tire failed to give satisfactory service, the customer will receive credit of 1/12 of the purchase price.

Sensible cracking

QUESTION: Why such effort to make high anti-knock gasoline?

ANSWER: Because motorists want it—sell high anti-knock gasoline and you can get a bigger share of the business

QUESTION: What is the best way to make the good anti-knock gasoline that the public wants?

ANSWER: By Dubbs cracking, because Dubbs cracking makes the biggest yield of the best anti-knock gasoline from any stock—at lowest cost—royalty and all

Dubbs cracking is more than wise cracking—it is sensible cracking

Universal Oil Products Co
Chicago Illinois

Dubbs Cracking Process
Owner and Licensor

Once Through Operation

Gives Better Results in

Reforming Naphthas

By E. J. LeRoi* and H. W. Ferguson*

Presented before American Petroleum Institute, Tulsa, May 17-19, 1933

NAPHTHA reforming is a direct outgrowth of the ever increasing demand for higher octane number motor fuels. Since the refiner has been dependent in the past on selection of crudes and blending fluids for anti-knock improvement, the application of naphtha cracking lends greater flexibility to refinery operation. It is essential, however, that the re-forming process be studied throughout a wide range of octane number improvement in order that the most economical point of operation be determined.

The experimental work, upon which the following discussion has been based, is the result of three years of plant operation on both straight run and cracked heavy naphthas. The combined and individual effects of time, temperature, and type of feed stock on yield, capacity, and product quality have been carefully analyzed for varying degrees of octane number improvement.

The straight run charge stocks used in the experimental work represents a mixture of cuts from Panhandle, Reagan, Salt Flat, Coastal, North-East Texas, and Humble-West Texas Crudes. The cracked stock was obtained by distillation of a heavy naphtha withdrawn from units cracking a mixed heavy gas oil derived from the above crudes. The characteristics of average samples of the charge stocks are given in Table 1.

*Humble Oil & Refining Co., Baytown, Tex.

Table 1

Average Inspections of Charge Stocks

	Straight Run Heavy Naphtha	Cracked Heavy Naphtha
Gravity, °API	51.0	45.0
I.B.P., °F	230	260
F.B.P., °F.	415	415
% at 400 °F.	96.0	97.0
10% off at	275	310
50% off at	315	340
90% off at	370	375
Aniline Point, °F.	132	112
Octane Number	31	52

Since the experimental work was spread over such long periods of time, complete analyses of the feed stocks were procured whenever possible in order to eliminate data on widely different heavy naphthas. The straight run naphthas processed in the first recycle runs were a broader cut stock than those charged in the later recycle and once-through runs. Only a slight variation in aniline point was observed on this stock (132 to 138 ° F.) in all runs made. The octane numbers ranged from 30 to 32 in most tests, with the exception of the last five coil-only runs, which showed 30 to 38 octane number feed stocks.

The cracked heavy naphthas were of uniform composition in all test runs. The octane number determinations on both charge stocks were obtained by direct comparison with iso-octane and normal heptane mixtures. These octane numbers were procured on a Series 30 engine.

Eight series of runs were made—five on the straight run stock and three on the cracked heavy naphtha, with operating conditions as shown in Table 2.

In Series 1 and 2, the octane number improvement was obtained by undercutting the end-point of the cracked distillate. The improvement was obtained in the other series by adjustment of coil outlet and temperature and/or feed rate. All operations were at 800 lbs. pres-

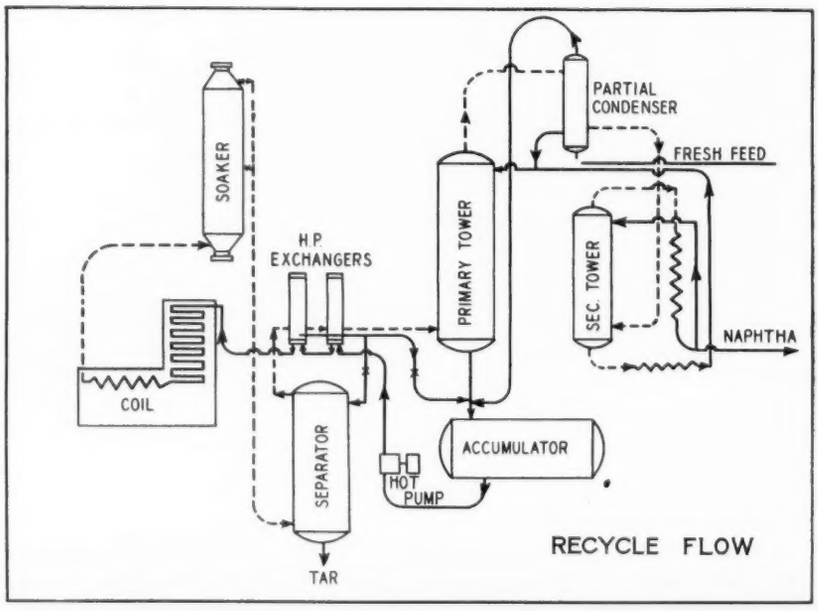


Fig. 1—Recycle flowchart of re-forming naphtha operation

Table 2

Types of Operations

1. Recycling straight run heavy naphtha with coil and soaker at 940° F. coil outlet temperature.
2. Recycling cracked heavy naphtha with coil and soaker at 924 to 930° F. coil outlet temperature.
3. Recycling straight run heavy naphtha with coil and soaker at 940 to 970° F. coil outlet temperature.
4. Once-through on straight run heavy naphtha with coil and soaker at 917 to 995° F. coil outlet temperature.
5. Once-through on cracked heavy naphtha with coil and soaker at 945° F. coil outlet temperature.
6. Once-through on straight run heavy naphtha with coil only at 980 to 1020° F. coil outlet temperature.
7. Once through on cracked heavy naphtha with coil only at 995 to 1025° F. coil outlet temperature.
8. Once-through on straight run heavy naphtha with coil only at 1020° F. coil outlet temperature and reduced pressure.

sure except Series 8 which was at 250 lbs. per sq. in.

The description of the equipment can be accomplished to the best advantage with the aid of flow diagrams. The units used in the experimental work were of the Tube and Tank type, equipped with a furnace capable of a 28 million B.t.u. per hour heat input to the oil.

Figure 1 shows the flow in a normal recycle operation in which the fresh feed is preheated in a partial vapor condenser and pumped to the accumulator where the cycle oil from the primary tower joins it to make up the total feed stream. Hot pumps force the total feed through high pressure exchangers, the coil, and the up-flow soaker (operating at 800 lbs. per sq. in.).

Pressure is released at the soaker outlet and the cracked stock flashes in the separator, where tar is removed from the bottom. The overhead vapors pass through the high pressure exchangers and fractionating equipment. The desired endpoint naphtha is partially condensed in a vapor to feed exchanger and passes through the final cooler to the receiving drum.

The once-through operation in Figure 2 differs from the first

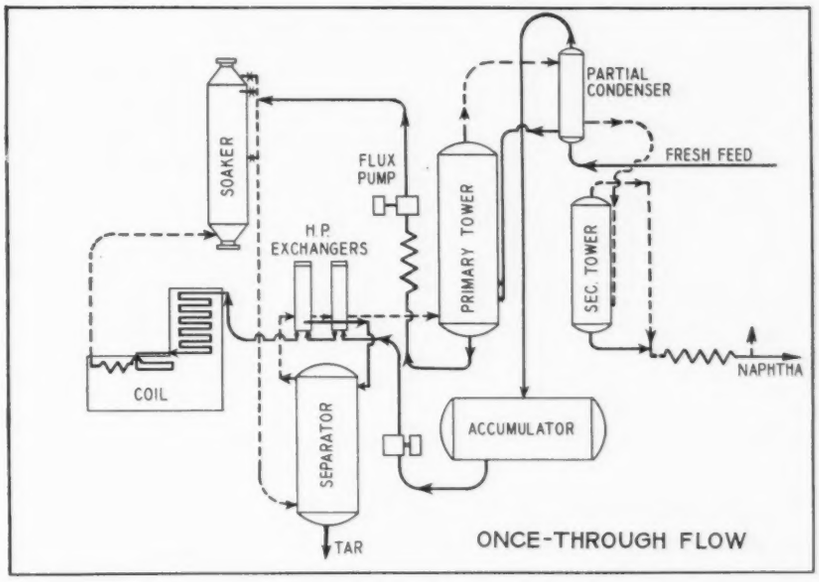


Fig. 2—Once-through flowchart of re-forming naphtha operation

hook-up in that no cycle fractions join the feed to the coil. A small stream of cycle oil from the bottom of the primary tower is withdrawn, cooled, and fluxed to the soaker outlet, which is equipped with a coke drill. The drilling and cooling action at the point of release is essential to satisfactory operation at the higher temperatures. No attempt is made to fractionate the distillate. In both operations, tar flux is admitted to the separator to control gravity.

The total distillate yield vs. octane number relationship for the recycling and once-through operations on both straight run and cracked naphthas is shown graphically in Fig. 3. In determining the yields, all liquid quantities were obtained from tank gauges and gas figures from meter readings. A butane recovery of 80% was used in calculating the casinghead content of the wet gases.

In order to discuss the yield relationships between operations on a comparable basis, all distillate quantities were corrected to a 400 F. naphtha in all cases where the endpoint exceeded 400 F. A yield of 60% was assumed on re-cracking the diesel fraction. The tabulation in Table 3 gives a clear picture of the degradation of the original charge stock to gas and tar for the several types of operation.

The data in Table 3 show clearly the decrease in degradation obtained by the once-through operation and recycle operation to 400 F. endpoint naphtha as compared to the recycle operation in which octane number improvement was obtained by undercutting endpoint. The degradation per point of octane number improvement in Series 3 and 4 is about the same in the range investigated. The once-through operation is more feasible in a case where a 420° F. endpoint finished gasoline is required, since the quantity between 420° F. and the endpoint is but 2 to 4% and furnishes an excellent rerun bottom.

The coil-only once-through

Table 3

Straight Run Heavy Naphtha

Octane No. Range	% Degradation per Point of Octane No. Improvement Series 1 (Recycle, 940° F.)	Series 3 (Recycle, 940-970° F.)	Series 4 (Once-Thru, 917-995° F.)
31 to 60	0.39	0.29	0.30
60 to 65	0.56	0.44	0.42
65 to 70	0.98	0.70	0.68
70 to 75	1.38	0.90	0.90
75 to 80	1.61*	.....	1.12
80 to 85	.....	.....	1.28

*Based on 75.0 to 78.6 octane number basis.

Table 4

Comparison of Degradation for Coil Only and Coil Soaker Operation on Straight Run Heavy Naphtha

Coil Only—Straight Run Naphtha		Coil and Soaker St. Run Naphtha	
Octane Number Range	% Degradation per O.N. Improvement	Octane No. Range	% Degradation per O.N. Improvement
31.0 to 73.0 (800 lb.)	0.32	31.0 to 73.0	0.40
36.0 to 70.5 (800 lb.)	0.40	31.0 to 65.5	0.33
38.2 to 65.8 (800 lb.)	0.29	31.0 to 58.6	0.30
37.7 to 73.5 (800 lb.)	0.48	31.0 to 66.8	0.34
36.0 to 65.8 (250 lb.)	0.44	31.0 to 60.8	0.31
36.6 to 72.8 (250 lb.)	0.43	31.0 to 67.2	0.35

Table 5

Comparison of Degradation on Cracked and Straight Run Naphtha Operation

Cracked Heavy Naphtha		Straight Run Heavy Naphtha	
Octane Number Range	% Degradation per O.N. Improvement	Octane Number Range	% Degradation per O.N. Improvement
52.0 to 80.2 (R)	1.21	31 to 59.2 (R)	0.38
52.0 to 81.8 (R)	1.42	31 to 60.6 (R)	0.39
52.0 to 70.0 (O)	0.59	31 to 49.0 (O)	0.29*
52.0 to 80.0 (O)	0.76	31 to 59 (O)	0.30

(R)—Recycle operation undercutting end-point.
(O)—Once-Through operation.
*Extrapolated.

runs were made to determine whether or not the decreased time at higher temperatures would lessen degradation. The effect of pressure on cracking conditions was also investigated. Table 4 gives the comparison. The degradation per point of octane number improvement is about the same in the coil-only runs at 800 lbs. as was realized with the coil and soaker. Operation at 250 lbs. showed a definite tendency toward increased degradation. This point has also been observed in research work by other companies.

A comparison is made in Table 5 between the cracked and straight run heavy naphtha on the basis of the same overall octane number improvement. In the range indicated, straight run naphtha cracking results in a much lower degradation loss. However, for the range of 75 to 80 octane number, in the once-through runs, the degradation for both types of heavy naphtha is about the same. A compensating factor for the higher degradation realized in the cracking of cracked naphthas, as compared to cracking straight run naphtha, lies in the fact that no additional treating costs are incurred in the former procedure as the cracked naphtha has to be treated in any event.

So far in the discussion, comparisons between operations have been based principally upon degradation. Unit capacity and product quality should also be considered.

Table 6 points out the capacity advantage of the once-through coil and soaker flows at 800 lbs. pressure over the other types of operation on straight run stock. Of the two coil-only flows, the high pressure operation is considerably better from the standpoint of feed rate. The recycle operations are all lower in capacity. The same observations hold true for the cracked stocks.

The foregoing conclusions are based on the use of existing equipment for naphtha re-forming service. In the design of new equipment, a coil-only high pressure flow would more than likely be more feasible since it eliminates the expense of a soaker installation.

The characteristics of the total distillates produced in the several types of operation are presented graphically in Figure 4.

The fills of the total naphtha at 212° F. and 284° F. are given for the once-through coil and soaker operation on straight run heavy naphtha at 800 lbs., the recycle undercutting operation on straight run naphtha; and once-through coil-only flow on cracked heavy naphtha at 800 lbs. pressure. The coil-only data on the natural stock and the coil and soaker data on the cracked naphtha operation were in close agreement with the aforementioned results, and therefore are not included.

The recycling operation in which octane number was obtained by undercutting endpoint resulted in a naphtha of much greater volatility. For example: the fill of a 70 octane number naphtha in Series 3 and 4 was approximately 16% as compared to 24% when recycling. The only possible economical application of the latter operation would be to a refinery situation in which volatility is at a premium.

Butane production from naphtha cracking increases with

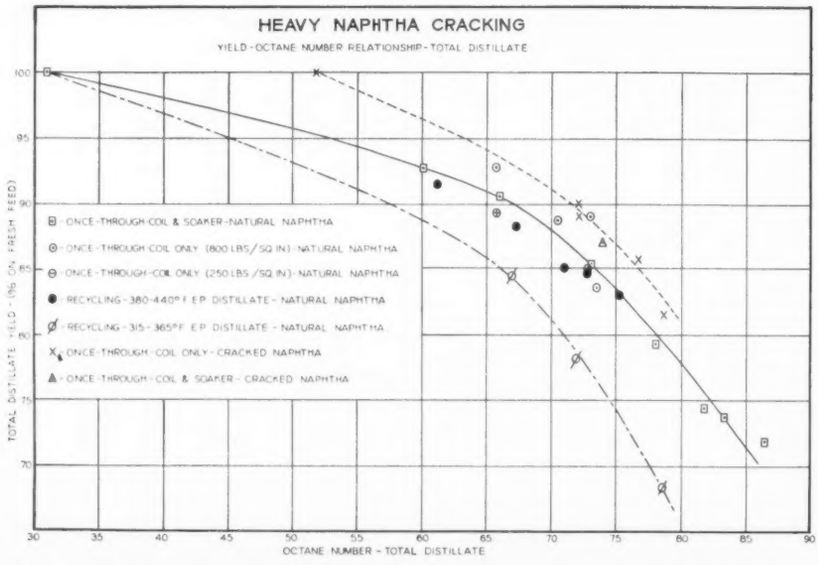

HEAVY NAPHTHA CRACKING
YIELD - OCTANE NUMBER RELATIONSHIP - TOTAL DISTILLATE
ONCE-THROUGH-COIL & SOAKER-NATURAL NAPHTHA
ONCE-THROUGH-COIL ONLY (800 LBS./SQ.IN.)-NATURAL NAPHTHA
ONCE-THROUGH-COIL ONLY (250 LBS./SQ.IN.)-NATURAL NAPHTHA
RECYCLING-380-440° F.E.P. DISTILLATE-NATURAL NAPHTHA
RECYCLING-315-365° F.E.P. DISTILLATE-NATURAL NAPHTHA
ONCE-THROUGH-COIL ONLY-CRACKED NAPHTHA
ONCE-THROUGH-COIL & SOAKER-CRACKED NAPHTHA
TOTAL DISTILLATE YIELD-VOL. ON FRESH FEED
OCTANE NUMBER - TOTAL DISTILLATE

Fig. 3—Relationship between octane number improvement and yields in re-forming naphthas by varying operating methods

MID-CONTINENT at its BEST!

CITIES SERVICE REFINERIES offer at wholesale to jobbers and tank car buyers a complete line of the highest quality Mid-Continent products ranging from "a can of cup grease to a carload of gasolene." For quality, quick delivery, attractive prices and an assured source of supply, make certain Cities Service Petroleum Products are included on your next bid list.

Cities Service Petroleum Products are available through the following companies and refineries

Name	Sales Offices	Refineries
EMPIRE OIL AND REFINING COMPANY	Tulsa, Okla.	Ponca City, Okla.
" " "	Chicago, Ill.	Okmulgee, Okla.
" " "	St. Louis, Mo.	Gainesville, Texas
" " "	Kansas City, Mo.	East Chicago, Ind.
" " "	St. Paul, Minn.	
LOUISIANA OIL REFINING CORPORATION	Shreveport, La.	Shreveport, La.
CITIES SERVICE REFINING COMPANY	Boston, Mass.	East Braintree, Mass.
CREW LEVICK COMPANY	Philadelphia, Pa.	Petty Island, N. J.
		Titusville, Pa.

Cities Service Oils and Gasolene

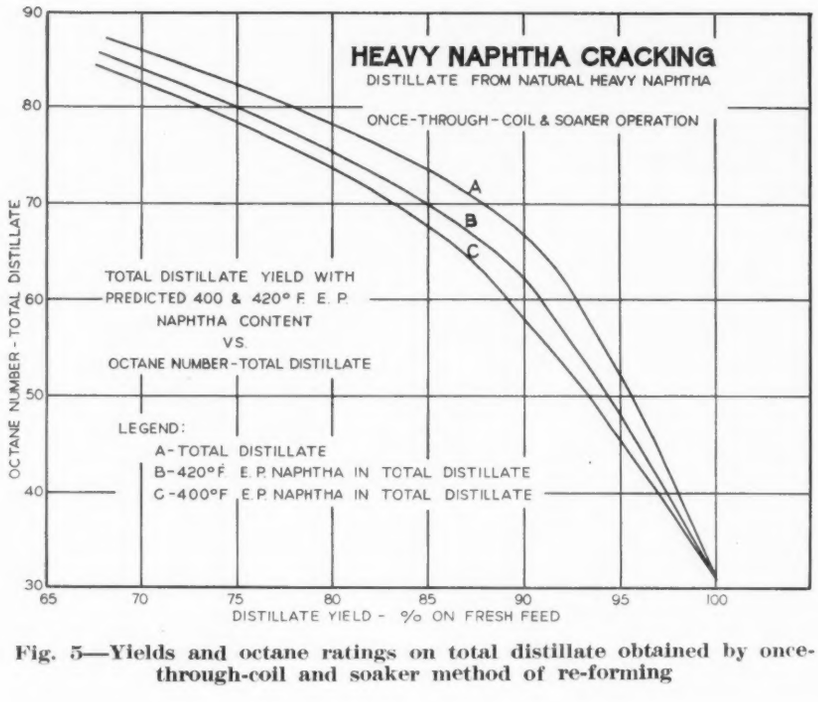


Fig. 5—Yields and octane ratings on total distillate obtained by once-through-coil and soaker method of re-forming

the degree of octane number improvement. This production can be absorbed in the gasoline up to a certain point, after which the butane must be discarded as fuel. No arbitrary figure for butane inclusion in the gasoline can be set since it depends entirely upon the individual refinery situation.

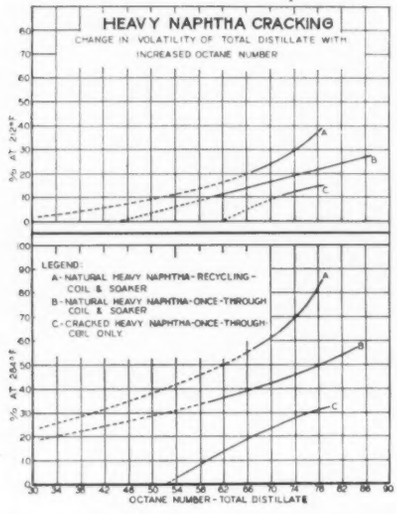

HEAVY NAPHTHA CRACKING
CHANGE IN VOLATILITY OF TOTAL DISTILLATE WITH INCREASED OCTANE NUMBER
LEGEND:
A-NATURAL HEAVY NAPHTHA-RECYCLING-COIL & SOAKER
B-NATURAL HEAVY NAPHTHA-ONCE-THROUGH COIL & SOAKER
C-CRACKED HEAVY NAPHTHA-ONCE-THROUGH COIL ONLY
OCTANE NUMBER-TOTAL DISTILLATE

Fig. 4—Changes in the volatility of the total distillate with different octane ratings

As has been pointed out previously, no attempt was made to fractionate the distillate from the once-through operation to a specified endpoint. In Figure 5, the naphtha yields after rerunning to 400° F. and 420° F. endpoint are plotted against the octane number of the total distillate. This comparison is for coil and soaker, once-through cracking of straight run stocks. A maximum loss of 4% on fresh feed occurs when rerunning to 420° F. and 8% when producing a 400 F. endpoint by redistillation.

At this point, it may be well to discuss briefly the limitations to operation which were encountered in the experimental work. All the runs were made at maximum furnace capacity. The recycle operation on the natural stock in the 940 to 970° F. temperature range presented no operating difficulties. Similar operation on the cracked stock gave evidence of short runs due to release nozzle coke trouble. This condition could undoubtedly be overcome by the use of a coke drill.

The once-through coil and soaker operation with a coke drill presented no difficulties in the 917 to 980° F. coil outlet temperature range. Runs of 30 days are not uncommon. The 980 to 995° F. coil outlet temperature operation was limited to short runs due to soaker coking. The coil-only flow on straight run naphtha required high coil outlet temperatures to secure octane number improvement. Operation at the higher temperatures was seriously limited by tube metal temperatures due to the high rates of heat input.

The once-through operations on cracked naphtha were limited to relatively short runs due to coke formation. The coil-only flow was hampered by coil coking and the coil and soaker operation was characterized by frequent drilling of the release nozzle.

Although no attempt has been made in this report to interpret the economic significance of the foregoing results, the yields and operating data presented are considered adequate for an economic analysis of any refinery situation.

Table 6

Coil Capacity in Barrels Per Day vs. Octane Number of Total Distillate

	Straight Run Heavy Naphtha					Cracked Heavy Naphtha		
Series of Run	1	3	4	6	8	2	5	7
Description	Recycling @ 940° F. at 800 Lbs.	Recycling to 400° F. End-Point @ 800 Lbs.	Once-Thru Coil and Soaker @ 800 Lbs.	Once-Thru Coil Only at 800 Lbs.	Once-Thru Coil Only at 250 Lbs.	Recycling @ 930° F. at 800 Lbs.	Once-Thru Coil and Soaker @ 800 Lbs.	Once-Thru Coil Only at 800 Lbs.
Distillate Octane No.	Bbls. per Day	Bbls. per Day	Bbls. per Day	Bbls. per Day	Bbls. per Day	Bbls. per Day	Bbls. per Day	Bbls. per Day
65.....	3,100	.....	6,250	5,050	4,300	.....	.....	.....
70.....	2,650	4,000	6,000	4,700	3,600	.....	6,100	4,800
75.....	2,200	.....	5,750	4,400	2,800	.....	.....	4,650
80.....	1,800	.....	5,500	4,000	.....	2,150	.....	4,500

Offers Specialized Lubrication Kit

KANSAS CITY—A specialized lubrication kit for the small garage, the farmer or the motorist who wants to grease his own car has been prepared for the jobbing trade by Battenfeld Grease & Oil Corp., Kansas City.

With this kit it is possible to have sufficient quantities of six kinds of specialized lubricants without having to buy large quantities of each. Required investment by the small garage, farmer or the individual motorist thus is materially reduced.

Included in the kit are: one 5-pound can of extreme pressure gear grease; one 3-pound can of all-shackle gun grease; one 1-pound can of universal joint grease; one 1-pound can of water pump grease; one 1-pound can of wheel bearing grease; and one 1-pound can of cup grease. Full directions for each grease are given in each kit.

The extreme pressure gear grease is described as passing requirements of the General Motors E. P. lubricant testing machine. The shackle lubricant is a semi-fluid lubricant designed for service in both the newer and older type shackles. The universal joint grease is for Spicer joints and the water pump grease is of a type which will not be washed out by hot water.

Plan District Meetings For Iowa Marketers

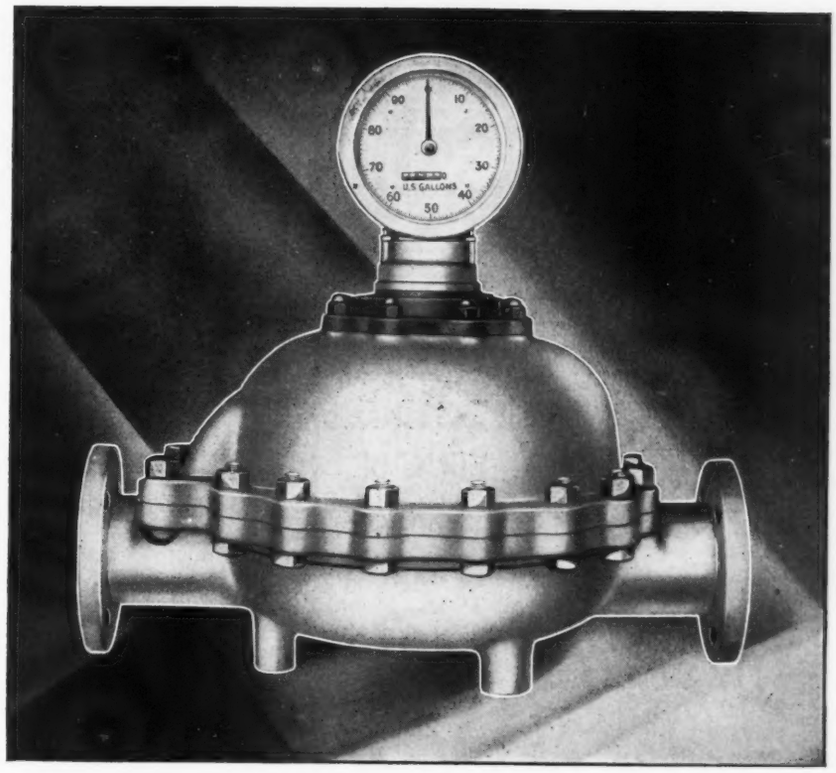
DES MOINES, May 12.—District meetings of Iowa marketers are being planned, M. L. Long, secretary of the Iowa Petroleum Association, announced here today.

The state has been divided into 11 districts, and the round of meetings is expected to be completed by July 1.

Following are the cities in which the district meetings will be held: Davenport, Dubuque, Cedar Rapids, Mt. Pleasant, Ottumwa, Des Moines, Red Oak, Sioux City, Ft. Dodge, Mason City, and Waterloo.

Missouri Escapes Oil Legislation

KANSAS CITY,Mo., May 13.—The Missouri legislature adjourned May 2 with the oil industry escaping any legislative action, the Bulletin of the Missouri Oil Men's Association says. Several oil bills were introduced, among them being those on chain stores, those providing bonds for all oil distributors, the anti-freeze solution bill, bills to amend the inspection laws, one for regulating gasoline coloring, those giving cities power to regulate and collect a privilege tax from trucks, and bus and truck regulation bills, none of which were passed.



THIS PRACTICAL METER Reduces Bulk Plant Shortages

Up-to-date oil companies are finding that even the best of checking and accounting systems do not eliminate the need for reliable gasoline and oil meters. Excessive shortages do persist, until the accurate *automatic* meter detects them.

Says one oil company: "The first month after we installed Niagara Meters, our shortage was 85% less than the preceding month." Another one reports: "For 12 years Niagara Meters have accurately checked every truck filled at our bulk plants, and have detected mistakes that would otherwise go unnoticed. We depend on them". And still another company: "Our customers bring their own trucks to our loading rack. Our Niagara Meters are essential in checking sales accurately".

Wherever gasoline or oil is moved, into tank cars, storage tanks or trucks, Niagara single-positive-piston meters will prove their worth. They avoid human errors, check every gallon and record it automatically, permanently, unchangeably.

Niagara Meters are *practical*, in accuracy, in design, materials, ruggedness, they ask no favor. New refinements have doubled their life, insure sustained accuracy. They are priced to meet 1933 budgets.

Let us help you reduce shortages!

BUFFALO METER CO.
2889 Main St. Buffalo, N. Y.

NIAGARA METERS

BUFFALO METER CO., 2889 MAIN ST., BUFFALO, N. Y.

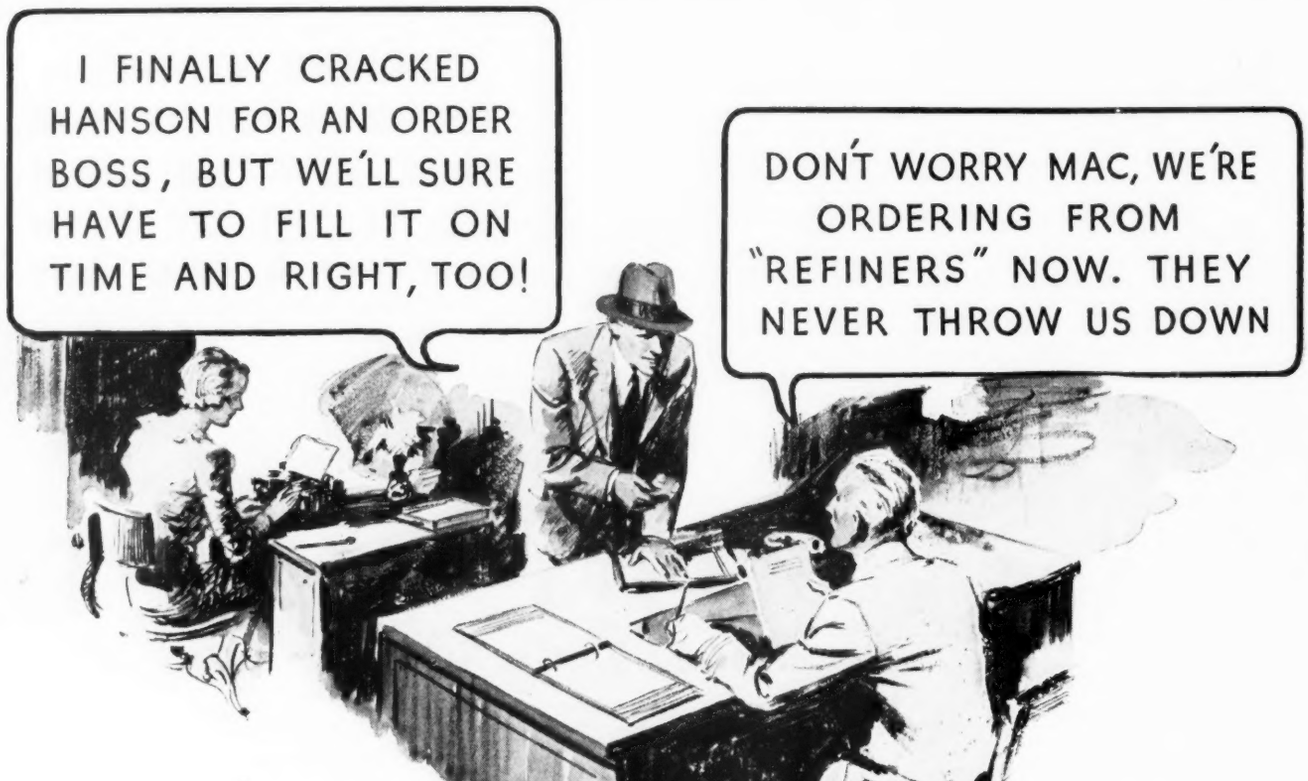
Please send full information on Niagara Meters for Bulk Plants.....

Pump-Equipped Tank Trucks.....

Name.....

Address.....

FAST, ACCURATE SHIPMENTS GUARANTEED BY REFINERS' DOUBLE-INSPECTION PLAN


I FINALLY CRACKED HANSON FOR AN ORDER BOSS, BUT WE'LL SURE HAVE TO FILL IT ON TIME AND RIGHT, TOO!
DON'T WORRY MAC, WE'RE ORDERING FROM "REFINERS" NOW. THEY NEVER THROW US DOWN

Your specifications met exactly—shipped immediately—to guard you from costly delays

NO LONGER need you take chances on mis-fit shipments—gamble on losing profits because of costly delays. Now, you can order from Refiners and be absolutely certain of getting just exactly *what* you want, *when* you want it.

Every shipment of blending stocks or finished oils you receive from Refiners carries the Double-Inspected Tag. No car or drum is allowed to leave without it. This tag is your guarantee. It certifies that in addition to the refinery inspection, this shipment has been inspected again by Refiners' own chemists, and found to be absolutely according to your specifications. Flash, fire, gravity, cold test and all other specifications are exactly as you ordered them.

But this isn't the only protection Refiners gives you. Before your shipment ever arrives, you have absolute assurance of its accuracy. With your shipping notice, comes a complete laboratory analysis of the stocks that are on their way. Refiners take no chances with your money. No matter what the needs of your market, by ordering from Refiners, you can fill them as easily and correctly as if you operated your own refinery.

No wonder hundreds of jobbers and independent chain owners depend on us for bright stocks, neutrals, or the finished oil. We can supply your needs too. A 100% pure Pennsylvania motor oil in 2-gallon cans has recently been added to our list. We can ship this and all other items on our list immediately. Give us a trial order—or mail coupon for estimates on the supplies you need.

REFINERS MARKETING COMPANY, Ltd.

Oil City, Pa.	Los Angeles, Calif.
National Transit Bldg.	555 S. Flower Street
Phone: 252	Phone: ML 3424

REFINERS MARKETING COMPANY, Ltd., Oil City, Pa.
☐ Please give us details about your 2-gallon can offer.
☐ Please send your estimate on the following stocks:

.....

Name .....

Address .....

.....NPN 5-17

Refinery - Tank Wagon Markets

Heavy Foreign Buying Appears as Domestic Trading Lags; Prices Steady

CLEVELAND, May 15

HEAVY foreign buying appeared in oil markets last week and overshadowed to a large extent the unfavorable developments in domestic market conditions. Favorable developments, however, were not wholly lacking in domestic markets. The first step toward the elimination of commercial discounts at service stations was taken in the east by the Standard Oil Co. of New York. And then there was a substantial revival of domestic industrial buying.

The week's worst news probably was the sharp reduction in retail gasoline prices throughout the middle west by the Standard of Indiana. This was pretty much of a blow to Mid-Continent refiners. Marginal contracts, of which there are many in the middle west, net the refiners some pretty low prices—on the average of nearly a full cent under current open market quotations.

With the United States' dollar selling at around 15 per cent discount, American oils are pretty much of a bargain to the foreign buyer. This has accounted to a large extent for the almost unprecedented foreign demand for lubricating oils although reports from the New York trade indicated the feeling among buyers that lubricating oil prices were due to go higher had spread to the far corners of the earth, and that this feeling was not confined to domestic market circles alone. The distressed East Texas market with resultant lower prices at the Gulf played a big part in the heavy foreign buying of light oils in this country.

Both Mid-Continent and Pennsylvania lubricating oils were actively sought by foreign buyers. There were numerous orders for bright stock and neutral oils in lots of 500 to 1200 barrels although bright stock perhaps got the heaviest play. Australian buyers took large quantities and both United Kingdom and Continental European companies were consistent buyers. Two cargoes of gasoline sold to European buyers bringing the total to date this month to 10 cargoes, according to reports. Foreign inquiry continued active as the week ended.

There was a noticeable pickup in industrial buying in domestic markets throughout the country. In some areas there were reports of some concerns doubling and tripling their takings of fuel oils and lubricants, that is, over their requirements of many months past. This furnished good support to markets and offset in some measure the lack of domestic jobbing demand. Refinery stocks were kept from piling up as fast as they would have had all types of trading been dormant. Much hope is pinned on a continued increase in general industrial activity by oil men.

Open market trading of gasoline was virtually at low ebb in all refinery areas except the west coast. Advancing retail markets in the Pacific coast district encouraged open market buying, whereas the reverse was true elsewhere. Margins on contracts from the Rocky Mountains east are so wide that open market quotations are high in comparison with prices jobbers are obtaining under contracts. Gallonage is lower than had been anticipated and jobbers in many instances were taking the maximum allowed under their contracts and reselling to other jobbers enabling the latter to beat the open market. Open market quotations, however, were generally unchanged in all areas. Refiners apparently realize that it would take drastic cuts in prices to stimulate open market demand.

While the heavy fuels were in good demand, the call for the lighter burning oils quieted down somewhat. Prices, however, were steady although offerings were freer in all markets.

Wax continued steady to higher in all markets.

Retail Price Cut Stifles Chicago Gasoline Trading

Staff Special

CHICAGO, May 13

THE revision in retail gasoline prices May 8 by Standard of Indiana was the outstanding event in the Chicago market in the week ended May 13, with developments in southwestern crude oil markets also coming in for a good share of the trade's attention.

Standard's action, which amounted to a reduction in normal gasoline price levels of from 2.2 to 3 cents a gallon and actual price changes which were reductions up to 3 cents in some instances and advances of small amounts at points where price structures were below the new normal level, had a very marked influence on the tank car gasoline market.

Summary of Group 3 Quotations for U. S. Motor Gasoline

In Effect May 15, 1933

	59 Octane and Below	60-64 Octane No.	65 Octane and Above
Okla.	2.25-2.375	2.625-2.75	2.875-3.00
Kans.	2.25-2.375	2.625-2.75	2.875-3.00
N. Tex.	2.25-2.375	2.50-2.75	2.75-3.00
W. Tex.	2.25-2.375	2.625-2.75	2.75-3.00
E. Tex.	2.00-2.125	2.50-2.625	2.75-2.875
La.-Ark.	2.125-2.375	2.50-2.75	2.75-3.00
Ind.-Ill.	2.00-2.25	.....	.....

Prices are those quoted on the basis of f.o.b. Group 3 by refiners in the districts designated.

The open, spot tank car market was affected to some extent by the retail reduction, but the main effect was on the marginal contracts which refiners had with their jobbers buying in tank cars. In practically all cases, these contracts specified a guaranteed margin of 5 cents under the normal retail price at point of destination and there were reports of cases where the guaranteed margin was as high as 6.5 cents. This meant that jobbers were buying on their contracts at very low prices, far under the spot tank car market. In some cases, it was reported, the refiner's netback actually amounted to a minus figure.

In view of these conditions, prac-

Prices A Year Ago

May 16, 1932

	Oklahoma	Penna.
58-60 U. S. Motor (57-65 Octane No. in Okla.)	5.25	6.50-6.75
Grade 26-70, Natural Gasoline	1.875	.....
Kerosine (Okla. 41-43; Pa. 47 w.w.)	4.125-4.25	5.25-5.50
Fuel Oil (Okla. 24-26; Pa. 36-40)	$0.425-$0.45	3.25-3.50
Crude (Okla. 35-35.9)	$0.90	$1.97
Chicago tank wagon (including 3c tax)	.....	16.00c

tically all the transactions reported during the week were made by these contract jobbers and open market gasoline business was light. In some cases, traders reported, jobbers with favorable contracts were buying considerably more gasoline than they required for their own outlets and were selling in tank wagon lots to other jobbers at prices lower than could be bought in tank cars on the open market.

Traders who sell on the open market generally reported they were making little effort to do gasoline business in view of present retail conditions and reports from Oklahoma and Texas of the continued unsettled status of the crude oil market. Generally speaking, gasoline showed little change in price on the open market during the week. Low octane grades of U. S. Motor were offered more freely by some sellers and prices were off 0.125 cent, but the higher octane grades appeared to be in good shape and prices were unchanged. Quotations for U. S. Motor, below 59 octane number, were mostly at 2 to 2.25 cents on May 13.

Kerosine was offered more freely for prompt shipment, but in most cases prices were about unchanged. Sellers generally asked 2.75 to 2.875 cents for the 41-43 w.w. grade.

Demand for furnace oil continued at a fairly good rate, although some oil appeared on the market at slightly lower prices. The 38-40 prime white was available in a number of quarters at 1.75 cents on May 13.

Gas oil was available at lower prices although there appeared to be little distress material in the market. Quotations were about 0.125 cent lower by the end of the week.

Heavy fuel oils were reported comparatively hard to obtain for prompt shipment. Traders reported a considerable increase in demand from steel companies and other industrial plants. Prices generally were unchanged.

Chicago Tank Car Market

Following prices are in cents per gallon, except fuel oil in barrels, in tank car lots, representing majority of sales to jobbers on Group 3 freight basis, although shipments may originate in other refining districts, such as North, West and East Texas, Louisiana, Arkansas, Indiana, Illinois, Kentucky, etc. Prices do not include state or federal taxes levied on some products.

	Prices May 15	Prices May 8	Prices May 1
50-52, 437 e.p. naphtha	2.00	2.00	2.00
U. S. Motor Gasoline, *by octane numbers:			
59 and below	2.00 – 2.25	2.125– 2.375	2.125– 2.25
60-64	2.50 – 2.75	2.50 – 2.75	2.375– 2.625
65 and above	2.75 – 3.00	2.75 – 3.00	2.625– 2.75
60-62, 400 e.p. gasoline, *by octane numbers:			
59 and below	2.125– 2.375	2.125– 2.375	2.125– 2.375
60-64	2.50 – 2.75	2.50 – 2.75	2.375– 2.625
65 and above	2.75 – 3.00	2.75 – 3.00	2.625– 2.875
64-66, 375 e.p. gasoline	2.625– 2.75	2.625– 2.75	2.625– 2.75
68-70, 350-360 e.p. gasoline	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
Aviation Gasoline, below 73 octane number	3.25 – 3.50	3.375– 3.50	3.375– 3.50
41-43 water white kerosine	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
42-44 water white kerosine	2.875– 3.00	2.875– 3.00	2.875– 3.00
38-40 prime white Furnace Oil	1.75 – 1.875	1.875– 2.00	1.875– 2.00
38-40 straw Furnace Oil	1.75	1.875	1.875
32-36 dark gas oil	0.75 – 1.00	0.875– 1.00	0.875– 1.00
32-36 dark zero gas oil	1.50 – 1.75	1.625– 1.75	1.625– 1.75
32-36 straw zero gas oil	1.625– 1.75	1.625– 1.75	1.625– 1.75
28-30 zero fuel oil (per bbl.)	$0.65 –$0.70	$0.65 –$0.70	$0.65 –$0.70
28-30 fuel oil (per bbl.)	$0.50 –$0.55	$0.50 –$0.55	$0.50 –$0.55
24-26 fuel oil (per bbl.)	$0.35 –$0.40	$0.35 –$0.40	$0.35 –$0.40
18-22 fuel oil (per bbl.)	$0.275–$0.30	$0.275–$0.30	$0.275–$0.30
18-22 zero fuel oil (per bbl.)	$0.425–$0.45	$0.425–$0.45	$0.425–$0.45
14-16 fuel oil (per bbl.)	$0.25 –$0.275	$0.25 –$0.275	$0.25 –$0.275

*Octane numbers are determined by C.F.R. motor method (ASTM D 357-33T).

Naphtha and Solvent

(Prices are in cents per gallon, in tank car lots, as quoted by Chicago sellers)

	May 15		May 8	
	F.O.B. Group 3 Basis	F.O.B. Chicago District	F.O.B. Group 3 Basis	F.O.B. Chicago District
Stoddard Solvent	4.50 – 5.00	7.00 – 9.00	4.50 – 5.00	7.00 – 9.00
V. M. & P. Naphtha	4.75 – 5.25	7.50	4.75 – 5.25	7.50
Cleaners Naphtha	5.00 – 5.25	9.00	5.00 – 5.25	9.00
Oleum Spirits	4.00 – 4.25	6.00	4.00 – 4.25	6.00
Rubber Solvent	4.75 – 5.25	10.00	4.75 – 5.25	10.00
Lacquer Diluent	6.50 – 6.75	9.50	6.50 – 6.75	9.50

Mid-Continent Refinery Markets

Open Market Gasoline Buying At Standstill

Staff Special
TULSA, May 13

OPEN market buying of Mid-Continent gasoline slowed down almost to a standstill the second week of May while contract shipments were maintained at a brisk pace.

The spreading of the Texas crude price cuts to all Mid-Continent producing areas, and the sizeable reduction in retail gasoline prices in the Standard Oil Co. of Indiana territory put a crimp in open market buying. But the reductions in the retail gasoline prices stimulated contract movement and generally speaking gasoline movement for the week was about normal for this season of the year, most refiners reported.

The retail gasoline price cuts naturally unsettled the market considerably from the jobbers' viewpoint and they did as they always have done—remained out of the open market to await developments, in the belief there would be further price recessions.

The jobbers who have contracts with Mid-Continent refiners also realized it was to their advantage to buy strictly on those contracts at present, since the open market prices showed little tendency to drift to lower levels.

That the contract buyers had an advantage can be seen from figures obtained from the Western Petroleum Refiners Association's statistical department. The average service station price at 31 points in the Standard of Indiana territory following the reductions of May 8 was 13.539 cents a gallon. The average freight rate from Group 3 to those 31 points is 2.905 cents a gallon, and the average of state, municipal and federal taxes is 4.274 cents a gallon.

The freight and taxes, therefore, total 7.179 cents a gallon, which subtracted from the 13.539 cents gives a margin of 6.36 cents a gallon. Jobbers who have a straight 5-cent marginal guarantee in their contracts were paying only 1.36 cents a gallon for their gasoline. Jobbers who had the "50-50" split clause in their contracts were paying slightly more, but still less than prevailing open market prices.

Offerings of East Texas gasoline for northern shipment were more numerous late in the week, but most of this gasoline was in the hands of resellers.

Natural gasoline buying was lighter in both Oklahoma and Texas. Most of the movement was to the Gulf coast. The reports of an increase in gasoline buying at the Gulf for export brought some optimism to manufacturers, since natural gasoline is required in most instances to "pep up" the gasoline in storage at Gulf terminals.

Kerosine buying was lighter in several districts and more material was offered in the open market but demand still was sufficiently good to keep prices at generally unchanged levels. The better grades of kerosine were still scarce.

Furnace oil buying apparently was as brisk as it has been for some time and prices held their ground well in spite of the freer offering of kerosine.

Inquiries were more numerous for zero gas oil. This was taken in some quarters as an indication buyers were anticipating better prices at a later date and accordingly were building up storage. Other traders believed the increase in industrial activities reported throughout the country was responsible for the better demand.

Fuel oil showed some improvement in a few quarters as far as demand was concerned, particularly the lower gravity grades as industrial buying was more pronounced.

Bright stock prices were unchanged. Refiners in the Mid-Continent give little heed to crude price reductions as far as bright stock prices are concerned. There are only certain fields from which the bulk of the bright stock crude comes and in the present instance it was pointed out that since most of these fields are produced by pumping, many of the wells would be shut down at present crude prices causing a possible shortage of the oil for bright stock manufacture.

Neutral oils also were unchanged in both price and demand. Wax inquiries were more numerous with prices well established at present levels.

California Refinery Market

Domestic Gasoline Continues Up Trend

LOS ANGELES, May 11

PACIFIC coast petroleum markets continued to buck the lower price trends of other parts of the country. Early in the past week, Standard Oil Co. of California boosted the prices of its Ethyl and first-grade white gasolines 0.5 cent a gallon and of its third-grade products, 1 cent a gallon.

These changes were effective only in the Los Angeles Basin area, since other marketing districts on the coast—not confronted with the cut-rate competition that prevails in southern California—had seen higher prices a week ago.

Other major and large independent marketing companies followed Standard's lead and at the end of the week prevailing retail prices for the three grades of gasoline in the Los Angeles territory were: Ethyl 19.5 cents, first-grade white 16.5 cents, and third-grade 12.9 cents. These prices are practically on a level with those in effect prior to the 25-cent cut in crude prices March 5.

The improvement in southern California gasoline prices was due largely to the ability of small independent refiners to sell their surplus gasoline, and to the decision of the larger marketing companies to adopt the policy of looking after their own business instead of trying to get that of their competitors.

Tank-truck-and trailer quotations on gasoline ranged from 9 to 9.5 cents at the independent refinery, including all tax. However, most independent products were being moved through distributors, who received a cent commission, so that, allowing this cent and an additional 0.25 cent for transportation to Los Angeles points, the net price delivered to the service stations was 10.25 to 10.75 cents.

Although a few stations with large storage facilities continued to buy direct from the refinery and post retail prices of 11.5 cents, a majority of the independent resellers in the Los Angeles Basin were posting 12.5-cent signs at the end of the week.

An average price of 4.75 to 5.5 cents appeared to be quoted on gasoline for shipment out of the state. Local suppliers continued to report difficulty in engaging the interest of Utah and Arizona accounts, owing to the competition offered by Group 3 and Texas refiners.

In the burning oil markets, gas and diesel oils remained unchanged at $0.80 to $0.85 and $0.75 to $0.85 a barrel, respectively. However, resumption of copper mining in Arizona and increased output by cement plants were creating increased demand for fuel oils. Current quotations in tank car lots ranged from $0.40 to $0.45.

Exporters were far from optimistic concerning the possibility of actual spot business within the next few months. A British account was reported making routine inquiries for quotations on a 375-400 e.p. gasoline. Nominal quotations were placed at 4 cents up, or about 2 cents higher than quotations on the Gulf, including the freight differential.

Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, except where $ is shown in tank car lots, f.o.b. Refinery. They represent prices made only to domestic jobbers who resell to the consuming public, except where otherwise noted. Tank car prices do not include state or federal taxes levied on some products.

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

	Prices May 15	Prices May 8	Prices May 1
OKLAHOMA (F. o. b. Oklahoma refineries)			
50-52, 450 e.p. naphtha...	2.25	2.125– 2.25	2.125– 2.25
U. S. Motor Gasoline			
59 octane and below...	2.25 – 2.375	2.25 – 2.375	2.125– 2.375
60-64 octane number...	2.625– 2.75	2.625– 2.75	2.50 – 2.75
65 octane and above...	2.875– 3.00	2.875– 3.00	2.75 – 2.875
60-62, 400 E.P. Gasoline..			
59 octane and below...	2.25 – 2.375	2.25 – 2.375	2.25 – 2.375
60-64 octane number..	2.625– 2.75	2.625– 2.75	2.50 – 2.75
65 octane and above...	2.875– 3.00	2.875– 3.00	2.75 – 3.00
64-66, 375 E.P. Gasoline..	2.75 – 2.875	2.75 – 2.875	2.625– 2.875
68-70 350-360 e.p. gasoline	2.875– 3.00	2.875– 3.00	2.75 – 3.00
Aviation Gasoline:			
Below 73 Octane number	3.25 – 3.50	3.25 – 3.50	3.375– 3.50
WESTERN PENNSYLVANIA			
52-54 Naphtha.....	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25
54-56 Naphtha.....	4.25 – 4.50	4.25 – 4.50	4.25 – 4.50
U. S. Motor (58-62).....	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
64-66 390 e.p. gasoline...	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
68-70 350-360 e.p.....	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
OHIO (Quotations of S. O. Ohio. Delivered any point in Ohio.)			
U. S. Motor Gasoline....	5.55	5.30	5.30
60-65 Octane number....	5.925	5.675	5.675
Above 65 Octane number	6.30	6.05	6.05
KANSAS (F. o. b. refinery, Kansas destination)			
U. S. Motor Gasoline			
59 octane and below...	2.375– 2.625	2.375– 2.625	2.375– 2.625
60-64 octane number..	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
65 octane and above...	3.00 – 3.125	3.00 – 3.125	2.875– 3.125
60-62 400 e.p. gasoline...	2.50 – 2.625	2.50 – 2.625	2.50 – 2.625
NORTH TEXAS‡ (F. o. b. Wichita Falls district refineries for unrestricted shipment)			
U. S. Motor Gasoline			
59 octane and below...	2.25 – 2.375	2.25 – 2.375	2.25 – 2.375
60-64 octane number..	2.50 – 2.75	2.625– 2.75	2.50 – 2.625
65 octane and above...	2.75 – 3.00	2.875– 3.00	2.75 – 2.875
60-62 400 e.p. gasoline...	2.375– 2.50	2.375– 2.50	2.375– 2.50
64-66 375 e.p. gasoline...	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
68-70 350-360 e.p. gasoline	2.875– 3.00	2.875– 3.00	2.875– 3.00
WEST TEXAS‡ (F. o. b. West Texas refinery for unrestricted shipment)			
U. S. Motor Gasoline			
59 octane and below...	2.25 – 2.375	2.25 – 2.375	2.25 – 2.375
60-64 octane number..	2.625– 2.75	2.625– 2.75	2.50 – 2.625
65 octane and above...	2.75 – 3.00	2.875– 3.00	2.75 – 2.875
EAST TEXAS‡ (F. o. b. East Texas refineries for unrestricted shipment)			
U. S. Motor Gasoline			
59 octane and below...	1.875– 2.125	2.125– 2.25	2.125– 2.25
60-64 octane number..	2.50 – 2.625	2.50 – 2.625	2.25 – 2.375
65 octane and above...	2.75 – 2.875	2.75 – 2.875	2.625– 2.75
NORTH LOUISIANA (For Louisiana and Arkansas destination)			
U. S. Motor Gasoline			
59 octane and below...	2.50	2.50	2.50
60-64 octane number..	2.875	2.875	2.875
65 octane and above...	3.125	3.125	3.125
ARKANSAS (For Arkansas and Louisiana destination)			
U. S. Motor Gasoline			
59 octane and below...	2.50	2.50	2.50
60-64 octane number..	2.875	2.875	2.875
65 octane and above...	3.125	3.125	3.125

Note: Octane numbers shown above in Oklahoma, Kansas, Texas, Louisiana and Arkansas, are determined by C. F. R. motor method. (A. S. T. M. D 357 — 33 T).

‡Refiners generally receive 0.25c to 0.5c per gallon more for gasoline and kerosine for local or differential territory shipment.

†Prices Nominal. ††Only one refiner Quoting. *Quotations only.

	Prices May 15	Prices May 8	Prices May 1
CALIFORNIA (3c tax to be added to California gasoline prices if used in state.)			
54-58 U.S. Motor, 437 e.p.	5.25 – 7.50	5.00 – 7.00	4.75 – 7.00
54-58 U.S. Motor, 437 e.p. for outside state shipment	4.75 – 5.50	4.75 – 5.50	4.50 – 5.50
43-45 Engine Distillate 445-480 e.p.....	4.75 – 5.75	4.75 – 5.75	4.50 – 5.75

NATURAL GASOLINE

OKLAHOMA (F. o. b. Group 3)			
Grade 26-70.....	1.25	1.25 – 1.375	1.375
NORTH TEXAS (F. o. b. Breckenridge)			
Grade 26-70.....	1.125	1.125– 1.25	1.25
CALIFORNIA (F. o. b. plants in the Los Angeles basin).			
77-85, 375-390 e.p. for blending.....	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25

BURNING OILS

WESTERN PENNSYLVANIA			
45 w.w. kerosine.....	4.125– 4.25	4.125– 4.25	4.125– 4.25
46 w.w. kerosine.....	4.25 – 4.50	4.25 – 4.50	4.25 – 4.50
47 w.w. kerosine.....	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
OKLAHOMA (F. o. b. Oklahoma refineries)			
41-43 w.w. kerosine.....	2.875– 3.00	2.875– 3.00	2.75 – 3.00
42-44 w.w. kerosine.....	3.00 – 3.125	3.00 – 3.125	2.875– 3.125
KANSAS (F. o. b. refinery Kansas destination)			
41-43 w.w. kerosine.....	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
42-44 w.w. kerosine.....	3.25 – 3.375	3.25	3.125– 3.25
NORTH TEXAS‡ (F. o. b. Wichita Falls district refineries for unrestricted shipment)			
41-43 w.w. kerosine.....	2.875– 3.00	2.875– 3.00	2.75 – 2.875
NORTH LOUISIANA‡ (For Louisiana and Arkansas destination)			
41-43 w.w. kerosine.....	3.25	3.25	3.25
ARKANSAS‡ (For Louisiana and Arkansas destination)			
41-43 w.w. kerosine.....	3.25	3.25	3.25
CALIFORNIA (F. o. b. California refineries)			
38-40 w.w. kerosine.....	3.50 – 4.25	3.50 – 4.25	3.50 – 4.25

NEUTRAL OIL

WESTERN PENNSYLVANIA

Viscous Neutrals (Viscosity at 70° F.)

Vis.			
200 (180 at 100) No. 3 color 420-425 flash:			
Zero pour test.....	18.50 –18.75	18.25 –18.50	18.25 –18.50
10 pour test.....	17.50 –17.75	17.25 –17.50	17.25 –17.50
15 pour test.....	16.50 –16.75	16.25 –16.50	16.25 –16.50
25 pour test.....	16.00 –16.25	15.75 –16.00	15.75 –16.00
180 No. 3 color, 410-415 flash:			
25 pour test.....	15.00 –15.25	14.50 –15.00	14.50 –15.00
150 No. 3 color, 400-405 flash:			
Zero pour test.....	16.00 –16.25	15.75 –16.00	15.50 –15.75
10 pour test.....	15.75 –16.00	15.50 –15.75	15.25 –15.50
15 pour test.....	14.00 –14.25	13.75 –14.00	13.50 –13.75
25 pour test.....	13.50 –13.75	13.25 –13.50	13.00 –13.25

Refinery Markets Wax, Lubricants, Heavy Oil

Prices given below are in cents per gallon, except where $ is shown in tank car lots, f.o.b. Refinery. They represent prices made only to domestic jobbers who resell to the consuming public, except where otherwise noted. Tank car prices do not include state or federal taxes levied on some products.

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)

****MID-CONTINENT** (F. o. b. Mid-Continent Refineries)

Vis.	Color	Prices May 15 (Viscosity at 100° F.) 0 to 10 Pour Point	Prices May 15 (Viscosity at 100° F.) 15 to 30 Pour Point	Prices May 8 (Viscosity at 100° F.) 0 to 10 Pour Point	Prices May 8 (Viscosity at 100° F.) 15 to 30 Pour Point
100	No. 2	4.50	4.00	4.50	4.00
150	No. 3	6.50	6.00	6.50	6.00
150	No. 4	6.25	5.75	6.25	5.75
180	No. 3	7.75	7.25	7.75	7.25
180	No. 4	7.50	7.00	7.50	7.00
180	No. 5	7.25	6.75	7.25	6.75
200	No. 3	8.25	7.50	8.25	7.50
200	No. 4	8.00	7.25	8.00	7.25
200	No. 5	7.75	7.00	7.75	7.00
220	No. 3	9.25	8.75	9.25	8.75
220	No. 4	9.00	8.50	9.00	8.50
220	No. 5	8.75	8.25	8.75	8.25
240	No. 3	10.25	9.50	10.25	9.50
240	No. 4	10.00	9.25	10.00	9.25
240	No. 5	9.75	9.00	9.75	9.00
280	No. 3	11.25	10.50	11.25	10.50
280	No. 4	10.75	10.25	10.75	10.25
280	No. 5	10.50	10.00	10.50	10.00

SOUTH TEXAS (F. o. b. South Texas refineries)

Vis.	Color	Prices May 15 (Viscosity at 100° F., pour test 0)	Prices May 8 (Viscosity at 100° F., pour test 0)	Prices May 1 (Viscosity at 100° F., pour test 0)
200	No. 3 Pale	5.50 – 6.00	5.50 – 6.00	5.50 – 6.00
300	No. 3 Pale	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
500	No. 3½ Pale	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50
750	No. 4 Pale	8.00	8.00	8.00
1200	No. 4 Pale	9.00	9.00	9.00
200	No. 5½ Red Oil	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
300	No. 5½ Red Oil	5.50 – 6.00	5.50 – 6.00	5.50 – 6.00
500	No. 6 Red Oil	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00
750	No. 6 Red Oil	7.50	7.50	7.50
1200	No. 5-6 Red Oil	8.50	8.50	8.50

Note: Red oil prices shown above cover oils with blue cast; one or two refiners ask 0.5c to 1c per gallon higher for green cast red oils.

CALIFORNIA (F. o. b. California refineries)

Vis.	Color	Prices May 15 (Viscosity at 100° F.)	Prices May 8 (Viscosity at 100° F.)	Prices May 1 (Viscosity at 100° F.)
100	No. 3	10.00	10.00	10.00
150	No. 3	10.00	10.00	10.00
200	No. 3	10.00	10.00	10.00
300	No. 3	11.50	11.50	11.50
450	No. 3	12.00	12.00	12.00
500	No. 3	12.00	12.00	12.00
550	No. 3	12.50	12.50	12.50
600	No. 3	12.50	12.50	12.50
100	No. 5	10.00	10.00	10.00
200	No. 5	10.00	10.00	10.00
300	No. 5	11.50	11.50	11.50
400	No. 5	12.00	12.00	12.00
500	No. 5	12.00	12.00	12.00
600	No. 5	12.50	12.50	12.50
700	No. 7	12.50	12.50	12.50
800	No. 7	13.00	13.00	13.00

CYLINDER STOCKS

MID-CONTINENT (F. o. b. Mid-Continent refineries)
(Prices represent quotations and Sales)

	Prices May 15	Prices May 8	Prices May 1
190-200 Vis. D at 210° Bright Stock	18.75	18.75	18.75
150-160 Vis. D at 210° Bright Stock:			
0-10 cold test	16.00	16.00	16.00
10-25 cold test	15.50	15.50	15.50
25-40 cold test	15.00	15.00	15.00
150-160 Vis. E 210° Bright Stock	15.00	15.00	15.00
600 St. Ref. Olive Green	4.00 – 5.50	4.00 – 5.50	4.00 – 5.50
600 St. Ref. Dark Green	3.50 – 4.50	3.50 – 4.50	3.50 – 4.50
630 Steam Refined	7.75	7.00	7.00
Black Oil	2.50 – 2.625	2.375– 2.625	2.375– 2.625

WESTERN PENNSYLVANIA (A. S. T. M. Tests)

	Prices May 15	Prices May 8	Prices May 1
600 Steam Refined	9.00 – 9.50	9.00 – 9.50	8.75 – 9.50
650 Steam Refined	11.50 –12.00	11.50 –12.00	11.25 –12.00
600 Flash	13.00 –13.50	13.00 –13.50	12.75 –13.50
630 Flash	17.75 –18.50	17.75 –18.50	17.75 –18.50
600 Warren E	13.75 –14.00	13.75 –14.00	13.75 –14.00
Bright Stock, No. 8 color, 140-150 vis. at 210°, 540-550 flash:			
10 pour test	22.00 –22.50	22.00 –22.50	22.00 –23.00
15 pour test	20.00 –20.50	20.00 –20.50	20.00 –21.00
25 pour test	19.00 –19.50	19.00 –19.50	19.00 –20.00

††Only one refiner quoting. †Prices Nominal.

WAX

	Prices May 15	Prices May 8	Prices May 1
WESTERN PENNSYLVANIA (Per pound, F. o. b. New York)			
122-124 white crude scale a.m.p.	2.10 – 2.125	2.05 – 2.10	2.00 – 2.05
124-126 white crude scale a.m.p.	2.125– 2.25	2.125	2.05 – 2.125
****OKLAHOMA** (Per pound in barrels; in a few instances, per pound in burlap bags; F. o. b. Oklahoma refineries.)			
124-126 White Crude Scale, a.m.p.	1.90 – 2.125	1.90 – 2.125	1.875– 2.00
CHICAGO (F. o. b. Chicago district refineries, in cents per pound, in bags, carload lots. Melting points are A.S.T.M. method; add 3° F. to convert into A.M.P.)			
122-124 fully refined	3.30	3.30	.....
125-127 fully refined	3.55 – 3.60	3.55 – 3.60	.....
127-129 fully refined	3.70 – 3.85	3.70 – 3.85	.....
130-132 fully refined	4.25 – 4.35	4.25 – 4.35	.....
132-134 fully refined	4.50 – 4.60	4.50 – 4.60	.....
135-137 fully refined	5.30 – 5.35	5.30 – 5.35	.....

GAS AND FUEL OIL

	Prices May 15	Prices May 8	Prices May 1
WESTERN PENNSYLVANIA (For outside Pittsburgh district)			
36-40 fuel oil	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
OKLAHOMA (F. o. b. Oklahoma refineries)			
38-40 Straw Furnace Oil	1.875– 2.125	1.875– 2.125	1.875– 2.125
32-36 straw gas oil	1.00 – 1.125	1.00 – 1.125	1.00 – 1.125
32-36 straw gas oil zero	1.625– 1.875	1.625– 1.875	1.625– 1.875
32-36 dark gas oil	0.875– 1.00	0.875– 1.00	0.875– 1.00
32-36 dark gas oil zero	1.625– 1.75	1.625– 1.75	1.625– 1.75
28-30 fuel oil, zero (per bbl.)	$0.60 –$0.65	$0.625–$0.675	$0.625–$0.675
28-30 fuel oil (per bbl.)	$0.45 –$0.50	$0.45 –$0.50	$0.45 –$0.50
24-26 fuel oil (per bbl.)	$0.325–$0.40	$0.325–$0.40	$0.325–$0.425
22-26 fuel oil (per bbl.)	$0.325–$0.375	$0.325–$0.375	$0.325–$0.375
18-22 fuel oil (per bbl.)	†$0.325–$0.375	†$0.325–$0.375	†$0.325–$0.375
16-20 fuel oil (per bbl.)	$0.30 –$0.35	$0.30 –$0.35	$0.30 –$0.35
14-16 fuel oil (per bbl.)	†$0.30 –$0.35	†$0.30 –$0.35	†$0.30 –$0.35
KANSAS (F. o. b. refinery Kansas destination)			
38-40 straw Furnace Oil	2.125	2.125	2.00 – 2.125
18-22 fuel oil (per bbl.)	$0.40 –$0.45	$0.40 –$0.45	$0.40 –$0.45
10-14 fuel oil (per bbl.)	$0.325–$0.375	$0.325–$0.375	$0.325–$0.375
NORTH TEXAS (F. o. b. Wichita Falls district refineries for unrestricted shipment)			
38-40 straw Furnace Oil	1.875– 2.125	1.875– 2.125	1.875– 2.00
38-40 prime white Furnace Oil	2.00 – 2.25	2.00 – 2.25	2.00 – 2.25
32-36 gas oil, zero	1.75 – 1.875	1.75 – 1.875	1.75 – 1.875
32-36 gas oil	0.875– 1.125	0.875– 1.125	0.875– 1.125
24-26 fuel oil (per bbl.)	$0.40 –$0.45	$0.40 –$0.45	$0.40 –$0.45
18-22 fuel oil (per bbl.)	$0.35 –$0.375	$0.35 –$0.375	$0.35 –$0.375
WEST TEXAS (F. o. b. West Texas refineries for unrestricted shipment)			
32-36 gas oil, zero	1.625– 1.75	1.625– 1.75	1.625– 1.75
18-22 fuel oil (per bbl.)	$0.475–$0.50	$0.475–$0.50	$0.475–$0.50
NORTH LOUISIANA (For Louisiana and Arkansas destination)			
32-36 gas oil	2.00 – 2.25	2.00 – 2.25	2.00 – 2.25
32-36 gas oil, zero	2.25 – 2.50	2.25 – 2.50	2.25 – 2.50
14-16 fuel oil (per bbl.)	$0.35 –$0.375	$0.35	$0.35
ARKANSAS (For Arkansas and Louisiana destination)			
32-36 gas oil	2.00 – 2.25	2.00 – 2.25	2.00 – 2.25
32-36 gas oil, zero	2.50	2.50	2.50
28-30 gas oil, zero	2.00 – 2.25	2.00 – 2.25	2.00 – 2.25
20-24 fuel oil (per bbl.)	$0.45 –$0.475	$0.45 –$0.475	$0.45 –$0.475
9-12 fuel oil (per bbl.)	$0.35 –$0.375	$0.35 –$0.375	$0.35 –$0.375
CALIFORNIA (F. o. b. refinery)			
14-18 fuel oil (per bbl.)	$0.40 –$0.45	$0.35 –$0.45	$0.35 –$0.45
14-18 Bunker oil (per bbl.)	$0.50 –$0.55	$0.50 –$0.55	$0.50 –$0.55
30-34 gas oil (per bbl.)	$0.80 –$0.90	$0.80 –$0.90	$0.80 –$0.90
27 Plus Diesel oil (per bbl.)	$0.75 –$0.85	$0.75 –$0.85	$0.75 –$0.85

PETROLATUMS

WESTERN PENNSYLVANIA (Per pound, in barrels, carload lots, f. o. b. Penna. refinery. In tank cars 0.625c to 0.75c per pound less.) Quotations are from majority of refiners.

	Prices May 15	Prices May 8	Prices May 1
Snow White	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
Lily White	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
Cream White	4.125– 4.50	4.125– 4.50	4.125– 4.50
Light Amber	2.25 – 2.50	2.25 – 2.50	2.25 – 2.50
Amber	2.00 – 2.25	2.00 – 2.25	2.00 – 2.25
Red	1.875– 2.00	1.875– 2.00	1.875– 2.00

***Quotations only. **Prices represent quotations and sales.**

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Eastern Domestic Markets

Gasoline Prices Show Little Change

Special

NEW YORK, May 13

GASOLINE markets along the eastern seaboard underwent little change during the week ended May 13. Some adjustments to price levels established in the Baltimore market were noted, but generally speaking, most suppliers were reluctant to quote lower than 4.5 cents in the key markets.

The wholesale and retail policy announced by the Standard Oil Co. of New York was of broad interest to the northern seaboard trade. Under this policy wholesale and retail prices will be predicated on the cargo market at the Gulf plus transportation charges. This new price structure will be put into effect throughout New York state and New England, except in metropolitan New York, Westchester county, Long Island and the Buffalo division of New York state. The latter district will continue to be based on the market at Oil City, Pa.

Following the adoption of this policy a new schedule of retail prices of gasoline was set up to be effective May 15. Advances in some districts were noted while reductions will take place in others. The policy of offering a 2-cent discount for cash at service stations will be generally adopted. Commercial discounts will be abandoned except on existing contracts most of which expire Jan. 1, 1934.

Tank car markets at New York harbor were fairly steady at 4.25 and 4.5 cents for the low and high octane grades, respectively. Suppliers were indicating little desire to sell below these prices. In fact, some sellers were narrowing the margin between large barges and tank car prices to 0.25 cent instead of the 0.5-cent differential which was formerly observed. Jobber buying was on a hand-to-mouth basis. Several reported that retail buying was slow and that they did not believe large inventories advisable.

Philadelphia suppliers were reluctant to lower quotations below 4.25 and 4.5 cents for the two grades of gasoline. Offerings in the Baltimore market were fairly general at 4 and 4.25 cents. These prices, it was said, narrowed the radius of shipments out of Philadelphia where the Baltimore freight rate was the same.

Trading in New England spot markets was slow throughout the week. Tank car prices for gasoline at Providence and Boston were unchanged at 4.75 and 5 cents for the low and high octane grades. Kerosine shipments continued fair despite the lateness of the season. Quotations and sales were ranging from 4.75 to 5.25 cents in the Boston area while in the Providence area tank car lots were usually quoted on the basis of 4.75 cents, f.o.b. terminals.

The markets for heavy oils provided a bright spot. Bunker oil, Grade C, at New York harbor and Boston was steady and active at $0.75 per barrel. The Philadelphia market for this oil was occasionally a few cents higher on local transactions. Diesel oil enjoyed a good demand at $1.65 per barrel at New York harbor.

Cargo lots of bunker oil at the Gulf were in demand with supplies available for prompt loading reported to be scarce. Although no sales were reported indications of prices were around $0.55 per barrel although several suppliers were quoting higher. According to one report a foreign buyer purchased a cargo of Mirando crude to be used as fuel oil.

Light oils were in demand throughout the week. In order to fulfill commitments abroad, one concern was said to have purchased six to eight cargoes of 64-66, 375 end point gasoline for fairly prompt shipment. In addition to this business, an American supplier sold a cargo of the same grade for June lifting at 3.25 cents. One refiner recently active in the export trade reported being sold up until August. This flurry of activity has left the Gulf market virtually cleaned out of gasoline available for prompt shipment. As the week ended, one inquiry remained in the market and that consisted of approximately 80,000 barrels of 61-63, 390 end point gasoline for June lifting. An English buyer was seeking this material.

A cargo of No. 2 furnace oil was reported purchased for domestic shipment at 2.75 cents. A cargo of Panuco crude was sold at $0.40 f.o.b. Tampico. Movements of gasoline into seaboard terminals largely consisted of intercompany transactions. Independent buyers were purchasing on a hand-to-mouth basis.

Wax Markets

Prices Generally Steady

NEW YORK, May 13.—Wax markets were fairly active during the week just ended. Continental buyers purchased the fully refined grades a bit more freely for prompt shipment. Domestic buyers continued to purchase only on a hand-to-mouth basis generally, but prices for the most part were steady.

Pennsylvania Markets

Neutral Oils Up 0.25 Cent

CLEVELAND, May 15.—Prices of all commodities were either higher or unchanged in the western Pennsylvania refinery market in the week ended May 13. Neutral oils advanced 0.25 cent. Bright stock suffered temporarily from a spell of price shading but was steadier as the week ended. Demand for gasoline, kerosine and fuel oil was light, but prices held their ground fairly well.

Continued good movement of lubricating oils under contracts together with a further decline in storage gave considerable support to open market prices last week when Pennsylvania crude prices were cut 20 cents a barrel. With the crude cut, open market buying came to a standstill. Buyers looked for lower lube prices but they did not materialize.

Buying of industrial lubricants, dormant for many months, and also heavy foreign buying furnished such a backlog of orders as the market has lacked for some time. The motor oil commitments of most refiners were such that there was some concern over the supply of neutral oil. Crude runs of course could be increased, but refiners have shown no inclination to do this and see stocks of other products, some of which already are top-heavy, pile up still further. Refiners in position to make immediate offerings of neutral oil advanced their quotations 0.25 cent on the last day of the week and offerings even at the higher prices were small in volume. More refiners continued to appear in the markets as buyers of neutral.

The record of neutral prices is remarkable. Prices of some grades now stand nearly 6 cents a gallon over the depression lows,—all grades are at least 4 cents higher. Every bit of the advance was attained in one month, to a day.

Gasoline continued slow throughout the week. It, however, ceased to be the distressing factor to the Pennsylvania refiner that it has been for months, almost years. Refiners in their study of the "Q" compound proposition saw a much better market for their gasoline, low in knock rating, in the future.

There was a substantial increase in demand for fuel oil from industrial buyers. Kerosine demand continued to ease off. Wax was scarce and with many refiners sold up well in advance, spot prices advanced slightly.

New Mobilgas Distributor

ROCKFORD, Ill. — The Kelley-Williamson Oil Co. has taken on the distribution of Mobilgas for its first and second grade motor fuels. The company formerly marketed its own gasoline brand, and will continue this policy on its third grade fuel.

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CLARENDON PENNSYLVANIA

Tank Wagon, Service Station Markets for Gasoline and Kerosine

(OIL PRICE HANDBOOK has t.w. and s.s. markets for a whole year, arranged for quick reference)

Tax column includes 1c federal tax, state gasoline tax; also city and county taxes as indicated in footnotes

These Prices in Effect May 15, 1933, as Posted by Principal Marketing Companies

Latest Changes in Tank Wagon Markets

Motor Gasoline

S. O. New York—New wholesale price structure put into effect in New York state, except in metropolitan area of New York City and New England, May 15. Structure is based on "cost plus": Gulf Coast gasoline market, plus transportation and handling charges. Commercial discounts at service stations were abolished except where contracts exist, most of which expire Jan. 1, 1934. The new s.s. price provides a 2c discount for cash to all customers.

At the points published in this tank-wagon table, these advances were made May 15; New York City, t.w. 0.7c, s.s. 1.7c; Albany, 0.3c; Buffalo, 0.7c; Rochester, 0.9c; Boston, 0.2c; Syracuse unchanged. Reductions were made at these points: Augusta, 1.3c; Manchester, 0.1c; Burlington, 0.8c; New Haven, 0.6c; and Providence, 0.3c. All changes are on both t.w. and s.s.

Atlantic Refining—T.w. and s.s. cut 3c. Brunswick, to 16c and 17c, May 9.

S. O. Kentucky—Corrections: **Crown** gasoline—Due to typographical errors, t.w. and s.s. at Vicksburg, Jackson and Augusta have been in error in the past issues, at 16c, 14c and 19c respectively. Vicksburg and Jackson were in error in the May 3 and 10 issues, and Atlanta since April 19 issue. Correct price at Vicksburg has been 18c, both t.w. and s.s.; effective Feb. 9; Jackson, 16c, effective Feb. 28; Atlanta, 20c, effective Feb. 13.

T.w. and s.s. cut 0.5c, Vicksburg, both to 17.5c, **April 25.**

T.w. and s.s. cut 1c, Louisville, both to 17c, **April 27.**

T.w. and s.s. cut 1c, Covington, both to 17c, **April 28.**

T.w. and s.s. cut 1c, Atlanta, both to 18c, **April 28**

T.w. and s.s. cut 2c, Miami, both to 19c, **April 27.**

T.w. and s.s. cut 2c, Tampa, both to 17c, **April 26.**

Kyso Green: Market re-established, Pensacola, at 16c, t.w. and s.s., **May 4.**

T.w. and s.s. cut 0.5c, Louisville, both to 14c, **April 27.**

T.w. and s.s. cut 0.5c, Vicksburg, both to 15.5c, **April 25.**

T.w. and s.s. cut 0.5c, Atlanta, both to 15c, **May 3.**

S. O. California—Standard t.w. and s.s. up 0.5c, Los Angeles, to 14c and 16.5c, respectively, **May 9.**

T.w. and s.s. up 0.5c, Fresno, to 15.5c and 18c respectively, **May 9.**

Flight: T.w. and s.s. up 1c, Los Angeles, to 11.9c and 12.9c, respectively, **May 9.**

T.w. and s.s. up 0.5c, Fresno, to 13.5c and 14.5c respectively, **May 9.**

Aviation Gasoline

S. O. California—T.w. up 0.5c, Los Angeles, to 17c, including tax, **May 9.**

T.w. up 0.5c, San Francisco, to 18.5c, including tax, **May 9.**

Kerosine

Atlantic Refining—Cut 1.4c, Hagerstown, to 9c t.w., **May 4.**

S. O. Kentucky—Cut 1c, Atlanta, to 10c, t.w., **May 6.**

Cut 3c, Augusta, to 11c, **May 1.**

S. O. Indiana — Correction. T.w. price Grand Forks, published in error in May 10 issue. Correct price 10.9c, effective **May 8.**

Magnolia Petroleum—Cut 1c, Fort Smith, to 8c, t.w.

S.O. NEW JERSEY TERRITORY

	Standard T.W.	Tax	Gasoline Total T.W.	S.S.	Kerosine T.W.
Atlantic City, N. J.	10	4	14	15	11.2
Newark, N. J.	8.9	4	12.9	12.9	8.5
Annapolis, Md.	9.6	5	14.6	15.6	9
Baltimore, Md.	9	5	14	15	8
Cumberland, Md.	10.5	5	15.5	16.5	11.7
Washington, D. C.	9.2	3	12.2	13.2	10
Danville, Va.	10.7	6	16.7	17.7	9.9
Norfolk, Va.	9.1	6	15.1	16.1	10.3
Petersburg, Va.	10.2	6	16.2	17.2	11.4
Richmond, Va.	9.5	6	15.5	16.5	10.7
Roanoke, Va.	10.7	6	16.7	17.7	11

S.O. NEW JERSEY (Cont'd)

	Standard T.W.	Tax	Gasoline Total T.W.	S.S.	Kerosine T.W.
Charleston, W. Va.	10.4	5	15.4	16.4	11.6
Parkersburg, W. Va.	9	5	14	15	10.2
Wheeling, W. Va.	10	5	15	16	11.2
Charlotte, N. C.	10.3	7	17.3	18.3	12.5
Hickory, N. C.	11.5	7	18.5	19.5	12.7
Mt. Airy, N. C.	11.4	7	18.4	19.4	12.8
Raleigh, N. C.	11.1	7	18.1	19.1	12.3
Salisbury, N. C.	11	7	18	19	12.6
Charleston, S. C.	9.1	7	16.1	17.1	10.3
Columbia, S. C.	11	7	18	19	12.2
Spartanburg, S. C.	8	7	15	16	12.5

S. O. NEW JERSEY (Cont'd)

Acto Gasoline (Third Grade)

	T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Annapolis, Md.	...	5	....	12	9
Washington, D. C.	...	3	....	10	10
Norfolk, Va.	...	6	....	15	10.3
Parkersburg, W. Va.	...	5	....	11	10.2
Charlotte, N. C.	...	7	....	15	12.5
Raleigh, N. C.	...	7	....	15	12.3
Columbia, S. C.	...	7	....	16	12.2

Discounts: To dealers on Standard gasoline, 2c off retail t.w. price, except Washington, D. C. and Baltimore, Md., where discount is 3c.

To commercial consumers: on t.w. deliveries, over a year off posted retail t.w.: 1,000 to 20,000 gals., 2c per gal.; 20,001 to 100,000 gals., 2.5c; 100,001 to 300,000 gals., 3c; and over 300,000 gals., 3.5c.

Service station discount to commercial consumers: on Standard gasoline, 2c per gal. off s.s. price, thru territory, effective Jan. 19, 1933; subject to cancellation on 10 days' notice. Acto sold for cash only.

Cash discounts at service stations: on gasoline, at some points, at least temporarily, cash discounts of 2c are being given off posted s.s. price.

Kerosine Discount: 1c off t.w. price for 25 gals. or more, under contract thru territory except New Jersey, effective June 17, 1931.

S. O. NEW YORK

Socony Gasoline

Greater New York City: Boroughs of Manhattan, Bronx, Queens & Kings	11.2	4	15.2	16.2	8
Borough of Richmond	11.2	4	15.2	16.2	7
Albany, N. Y.	11.3	4	15.3	16.3	9
Buffalo, N. Y.	12.2	4	16.2	17.2	9
Rochester, N. Y.	12.4	4	16.4	17.4	9
Syracuse, N. Y.	12	4	16	17	9.5
Boston, Mass.	11.2	4	15.2	16.2	8
Augusta, Me.	11.7	5	16.7	17.7	9
Manchester, N. H.	12.4	5	17.4	18.4	8
Burlington, Vt.	12.2	5	17.2	18.2	8.5
New Haven, Conn.	11.4	3	14.4	15.4	8
Providence, R. I.	11.2	3	14.2	15.2	8

Dealer discount: on gasoline 2c off posted t.w. price, except 3c in New York City.

Cash discounts at service stations: on gasoline, cash discount of 2c off posted s.s. price to all customers.

ATLANTIC REFINING

Atlantic White Flash Gasoline

Pittsburgh, Pa.	9.5	4	13.5	14.5	9
Philadelphia, Pa.	9.5	4	13.5	14	9
Allentown, Pa.	9.5	4	13.5	14.5	9
Erie, Pa.	9.5	4	13.5	14.5	9
Scranton, Pa.	9.5	4	13.5	14.5	9
Altoona, Pa.	9.5	4	13.5	14.5	9
Dover, Del.	9.5	4	13.5	14.5	9
Wilmington, Del.	9.5	4	13.5	14.5	9
Boston, Mass.	11	4	15	16	8
Springfield, Mass.	12.5	4	16.5	17.5	8
Worcester, Mass.	11.5	4	15.5	16.5	8
Fall River, Mass.	11.5	4	15.5	16.5	8
Providence, R. I.	11	3	14	15	8
Hartford, Conn.	12	3	15	16	8
New Haven, Conn.	12	3	15	16	8
Atlantic City, N. J.	10	4	14	15	9
Camden, N. J.	9	4	13	13	9
Trenton, N. J.	9.8	4	13.8	13.8	9.5
Annapolis, Md.	9.6	5	14.6	15.6	9
Baltimore, Md.	9	5	14	15	8
Hagerstown, Md.	9	5	14	15	9
Richmond, Va.	9.5	6	15.5	16.5	10.7
Wilmington, N. C.	9.2	7	16.2	17.2	10.4
Brunswick, Ga.	9	7	16	17	*13
Jacksonville, Fla.	10	8	18	19	9.5

Dealer discount: on gasoline "split dealers," 2c off posted t.w. price; to 100% dealers, 2.5c; to authorized dealers (under lease 1c per gal.), 2.5c off posted s.s. price. Commercial accounts, under contract for one year, are sold at a discount off the posted prices, with due consideration to competition.

Cash discounts at service stations: on gasoline, at some points, at least temporarily, cash discounts of 2c are being given off posted s.s. price.

*Georgia kerosine prices include 1c state tax.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/2c per gal. in a single barrel; 3/10c per gal. in lots of 2 to 10 bbls., 1/5c for 10 to 50 bbls., 2/25c for over 50 bbls.; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 2/25c; Missouri, gasoline, 1.5c per bbl., in lots of 10 bbls. or more; Nebraska, 3/50c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 1/25c.

Kerosine inspection fees only: Iowa, 2/25c; Michigan, 4/5c per gal. for first 2 bbls.; 3/5c for next 3; 2/5c for next 5; 3/10c for next 15, and 1/5c per gal. in lots over 25 bbls.

Tank Wagon, Service Station Markets for Gasoline and Kerosine

Tax column includes 1c federal tax, state gasoline tax; also city and county taxes as indicated in footnotes

These Prices in Effect May 15, 1933, as Posted by Principal Marketing Companies

S. O. OHIO

Sohio X-70 Gasoline

	T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Ohio statewide	10	5	15	16	10.5

Renown Green (Third Grade)

Ohio statewide	...	5	....	14	10.5

Tankwagon discount to dealers and commercial consumers: Sohio X-70, 2c off t.w. price and Renown Green, 1.5c off s.s. price. Kerosine, 2.5c off t.w.

Commercial discount at service stations: on Sohio X-70, to commercial users (trucks, buses), 2c off s.s. price.

S. O. KENTUCKY

Crown Gasoline

Lexington, Ky.	12.5	6	18.5	18.5	10
Louisville, Ky.	11	6	17	17	10
Paducah, Ky.	13	6	19	19	9
Covington, Ky.	11	6	17	17	11.5
Jackson, Miss.	9	7	16	16	*12
Vicksburg, Miss.	10.5	7	17.5	17.5	*12
Birmingham, Ala.	13	*8	21	21	13
Mobile, Ala.	11	*8	19	19	8
Montgomery, Ala.	13	*9	22	22	*14
Macon, Ga.	12	7	19	19	*14
Atlanta, Ga.	11	7	18	18	*10
Augusta, Ga.	13	7	20	20	*11
Savannah, Ga.	13	7	20	20	*14
Jacksonville, Fla.	11	8	19	19	9.5
Miami, Fla.	11	8	19	19	13.5
Tampa, Fla.	9	8	17	17	12
Pensacola, Fla.	11	*9	20	20	14

Kyso Green (Third Grade)

Lexington, Ky.	9.5	6	15.5	15.5	10
Louisville, Ky.	8	6	14	14	10
Paducah, Ky.	9.5	6	15.5	15.5	9
Covington, Ky.	9	6	15	15	11.5
Jackson, Miss.	7	7	14	14	*12
Vicksburg, Miss.	8.5	7	15.5	15.5	*12
Birmingham, Ala.	10	*8	18	18	13
Mobile, Ala.	8	*8	16	16	8
Montgomery, Ala.	10	*9	19	19	*14
Atlanta, Ga.	8	7	15	15	*10
Augusta, Ga.	10	7	17	17	*11
Macon, Ga.	9	7	16	16	*14
Pensacola, Fla.	7	*9	16	16	14

Dealer Discount: on Crown and Crown Ethyl gasolines, 3c off t.w. price thru territory; Kyso Green 2c. Effective Nov. 21, in Jefferson county, Ala., including Birmingham, major oil companies give 2c per gal. off s.s. price for cash, to buyers at stations, in any quantity. Effective Jan. 14, 1933, 2c per gal. discount off s.s. price for cash at Louisville by S. O. Kentucky.

***Taxes:** in the tax columns are included these city and county gasoline taxes at the following points: Birmingham, 1c city; Mobile, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Mississippi kerosine prices include 1c state tax; Montgomery kerosine price includes ½c city tax.

S. O. INDIANA

Standard Red Crown Gasoline

Chicago, Ill.	8.6	4	12.6	12.6	8
Decatur, Ill.	9	4	13	13	8.5
E. St. Louis, Ill.	8.3	4	12.3	12.3	7.8
Joliet, Ill.	9	4	13	13	8.5
Peoria, Ill.	9	4	13	13	8.5
Quincy, Ill.	8.8	4	12.8	12.8	8.3
Springfield, Ill.	9	4	13	13	8.5
Indianapolis, Ind.	9.2	5	14.2	14.2	‡12.7
Evansville, Ind.	9	5	14	14	‡12.5
South Bend, Ind.	9.5	5	14.5	14.5	‡13
Detroit, Mich.	9.5	4	13.5	13.5	9
Grand Rapids, Mich.	9.2	4	13.2	13.2	8.7
Saginaw, Mich.	9.5	4	13.5	13.5	9
Marquette, Mich.	12.1	4	16.1	16.1	9.3
Green Bay, Wisc.	9.2	5	14.2	14.2	8.7
Madison, Wisc.	8.9	5	13.9	13.9	8.4
Milwaukee, Wisc.	8.7	5	13.7	13.7	8.2
La Crosse, Wisc.	9.8	5	14.8	14.8	9
Minneapolis, Minn.	9.4	4	13.4	13.4	8.9
Duluth, Minn.	9.7	4	13.7	13.7	8.9
Mankato, Minn.	9.3	4	13.3	13.3	8.8
Des Moines, Ia.	9.1	4	13.1	13.1	8.6
Davenport, Ia.	9.1	4	13.1	13.1	8.6
Sioux City, Ia.	8.7	4	12.7	12.7	8.2
Mason City, Ia.	9.1	4	13.1	13.1	8.6
St. Louis, Mo.	7.7	*3.5	11.2	11.2	7.2
Kansas City, Mo.	8.2	†4	12.2	12.2	7.7
St. Joseph, Mo.	7.8	†4	11.8	11.8	7.3
Fargo, N. D.	11.1	4	15.1	15.1	10.6
Grand Forks, N. D.	11.4	4	15.4	15.4	10.9
Minot, N. D.	11.1	4	15.1	15.1	10.6
Pierre, S. D.	10	5	15	15	9.5
Huron, S. D.	10.3	5	15.3	15.3	9.8
Wichita, Kan.	7.1	4	11.1	11.1	6.6
Bartlesville, Okla.	7.5	5	12.5	15	8

Note: Kerosine s.s. prices are generally 3c above normal t.w. price.

S. O. INDIANA (Cont'd)

Stanolind Gasoline (Third Grade)

Stanolind prices, effective May 8, 1933, are 1c under Red Crown, thru territory, except at following points:

	T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Bartlesville, Okla.	6	5	11	12	8

†Includes city tax of 1c. *Includes city tax of 0.5c. ‡Includes 4 cent state tax.

O.D.A. (Effective May 4, 1931):

Discounts to resellers, except in Chicago, all quantities per month:
Off s.s. under 75,000 gals.: Ethyl: 3c, Red Crown 2.5c, Stanolind 1.5c. Off t.w. over 75,000 gals.: Ethyl 4c, Red Crown, 3.5c, Stanolind 2c.

Chicago reseller discounts: any quantity Ethyl 4c, "regular" 3.5c, third grade 2c, by principal marketers. Discounts are off s.s. below 75,000 gals., and off t.w. above 75,000 gals.

Consumer discounts, off t.w., outside Chicago: 500 to 75,000 gals., Ethyl 3c, Red Crown 2.5c, Stanolind 1.5c. Over 75,000 gals., Ethyl 4c, Red Crown 3.5c, Stanolind 2c.

Chicago consumer discounts, off t.w.: over 500 gals., Ethyl 4c, regular 3.5c, third grade 2c.

Dump discount to all t.w. buyers eliminated May 8, 1933.

Discount to commercial consumers at service stations (company owned or controlled stations), beginning Oct. 1, 1932: 1c per gal. off s.s. price on Ethyl and Standard Red Crown gasolines, in any quantity.

S. O. NEBRASKA

Red Crown Gasoline

Omaha, Neb.	11.3	5	16.3	17.3	8
McCook, Neb.	12	5	17	17	8.5
Norfolk, Neb.	11.8	5	16.8	17.8	8
North Platte, Neb.	12	5	17	17	9
Scottsbluff, Neb.	12	5	17	17	9.5

Reliance Gasoline (Third Grade)

Omaha, Neb.	9.2	5	14.2	14.2	8
McCook, Neb.	7.9	5	12.9	12.9	8.5
Norfolk, Neb.	9	5	14	15	8
North Platte, Neb.	9.9	5	14.9	14.9	9
Scottsbluff, Neb.	10	5	15	15	9.5

Dealer discount: on gasoline off normal s.s. prices: Ethyl 3c; Red Crown 2.5c; Reliance 1c.

S. O. LOUISIANA

Standard Gasoline

	Posted Retail T.W.	Tax	Total Posted Retail T.W.	Posted Retail S.S.	Kerosine T.W.
Little Rock, Ark.	8.5	7	15.5	15.5	10
Alexandria, La.	7	*7	14	14	*8.5
Baton Rouge, La.	9	6	15	15	*10
New Orleans, La.	7	*7	14	14	*11
Lake Charles, La.	8	*7	15	15	*10
Shreveport, La.	8	6	14	14	*11
Lafayette, La.	8	*7	15	15	*10
Bristol, Tenn.	10	8	18	18	13
Chattanooga, Tenn.	10.5	8	18.5	18.5	11
Knoxville, Tenn.	11.5	8	19.5	19.5	12.5
Memphis, Tenn.	10	8	18	18	10
Nashville, Tenn.	11	8	19	19	10

Acto Gasoline (Third Grade)

	Tax	Total Posted Retail S.S.	Kerosine T.W.
Little Rock, Ark.	7	14	10
Alexandria, La.	*7	12	*8.5
Baton Rouge.	6	14	*10
New Orleans, La.	*7	12.5	*11
Lafayette, La.	*7	14.5	*10
Lake Charles, La.	*7	13.5	*10
Shreveport, La.	6	11.5	*11
Bristol, Tenn.	8	15.5	13
Chattanooga, Tenn.	8	17	11
Knoxville, Tenn.	8	16.5	12.5
Memphis, Tenn.	8	17	10
Nashville, Tenn.	8	16	10

Open dealer discounts: on Standard gasoline, 2½c per gal. off posted retail t.w. price; 2c on kerosine; no discount on Blue-Gas. Commercial consumers get sliding scale of discounts.

To commercial consumers: on Standard gasoline, on t.w. deliveries, per year, off t.w. price: up to 75,000 gals., 2.5c; 75,000 to 149,999 gals., 3c; 150,000 to 299,999 gals., 3.5c; 300,000 gals. and over, 4c.

Lease and agency discounts: Esso gasoline, 2.5c; Standard gasoline, 2c; Blue-Gas, 1c off s.s. price, plus 1c per gal. rental.

*Lake Charles, Alexandria, New Orleans and Lafayette gasoline tax includes 5c state tax, 1c federal tax, and 1c parish tax. Louisiana kerosine prices include 1c state tax; New Orleans includes also 1c parish tax.

MAGNOLIA PETROLEUM

	T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Muskogee, Okla.	4.5	5	9.5	12	6
Oklahoma City.	6.5	5	11.5	14	8
Tulsa, Okla.	7.5	5	12.5	15	8
Fort Smith, Ark.	8.5	†5	13.5	13.5	8
Little Rock, Ark.	8.5	7	15.5	15.5	10
Texarkana, Ark.	9	*5	14	14	11
Dallas, Tex.	7.5	5	12.5	15	7
El Paso, Tex.	7.5	5	12.5	15	8
Fort Worth, Tex.	7.5	5	12.5	15	7
Houston, Tex.	7.5	5	12.5	15	8
San Antonio, Tex.	8.5	5	13.5	16	8

Metro Gasoline (Third Grade)

Muskogee, Okla.	4	5	9	10	6
Oklahoma City.	5	5	10	11	8
Tulsa, Okla.	6	5	11	12	8
Fort Smith, Ark.	7.5	†5	12.5	12.5	8
Little Rock, Ark.	7	7	14	14	10
Texarkana, Ark.	4	5	9	10	11
Dallas, Tex.	5	5	10	11	7
El Paso, Tex.	5	5	10	11	8
Fort Worth, Tex.	5	5	10	11	7
Houston, Tex.	5	5	10	11	8
San Antonio, Tex.	6	5	11	12	8

Dealer discounts: on Mobilgas 2.5c off t.w. price at Little Rock, Fort Smith and Texarkana. On Metro gasoline, 1c per gal. off t.w. price thru territory. Arkansas kerosine prices, 2c discount off t.w. price.

*In Texarkana, 4c Texas tax applies; outside Texarkana, 6c Arkansas tax applies.

†In Fort Smith, 4c Oklahoma tax applies; outside Fort Smith, 6c Arkansas tax applies.

CONTINENTAL OIL

Conoco Gasoline

Denver, Col.	9	5	14	17	12.5
Pueblo, Col.	9	5	14	17	12.5
Grand Junc., Colo.	13	5	18	21	14.5
Casper, Wyo.	11	5	16	19	10
Cheyenne, Wyo.	9	5	14	17	11.5
Butte, Mont.	14	6	20	23	17
Helena, Mont.	15	6	21	24	17
Salt Lake City, Utah.	11	5	16	19	16
Boise, Ida.	12.5	6	18.5	21.5	18
Twin Falls, Ida.	14.5	6	20.5	23.5	18
Albuquerque, N. M.	8	6	14	17	12

Third Grade Gasoline

Denver, Col.	7	5	12	14	12.5
Cheyenne, Wyo.	8	5	13	15	11.5
Helena, Mont.	14	6	20	22	17
Salt Lake City, Utah.	9	5	14	15	16
Boise, Ida.	11.5	6	17.5	18.5	18
Albuquerque, N. M.	*	6	*	14	12

*Not sold thru tank wagon.

S. O. CALIFORNIA

Standard Gasoline

San Francisco, Cal.	11	4	15	17.5	12.5
Los Angeles, Cal.	10	4	14	16.5	12.5
Fresno, Cal.	11.5	4	15.5	18	14
Phoenix, Ariz.	12	6	18	20.5	†16
Reno, Nev.	13.5	5	18.5	21	15.5
Portland, Ore.	10.5	5	15.5	18	13.5
Seattle, Wash.	10.5	6	16.5	19	13.5
Spokane, Wash.	13.5	6	19.5	22	18
Tacoma, Wash.	10.5	6	16.5	19	13.5

Flight Gasoline (Third Grade)

San Francisco, Cal.	9	4	13	14	12.5
Los Angeles, Cal.	7.9	4	11.9	12.9	12.5
Fresno, Cal.	9.5	4	13.5	14.5	14
Reno, Nev.	11.5	5	16.5	17.5	15.5
Phoenix, Ariz.	9	6	15	16	†16
Portland, Ore.	8.5	5	13.5	14.5	13.5
Seattle, Wash.	8.5	6	14.5	15.5	13.5
Tacoma, Wash.	8.5	6	14.5	15.5	13.5
Spokane, Wash.	11.5	6	17.5	18.5	18

†Includes 5c state tax.

Discounts: On all gasolines: to 100% dealers, off 1c t.w. price thru territory.

CANADA

Prices of Imperial Oil Ltd.

(Per Imperial Gallon, which is 1.2 U. S. Gallons)

Imperial Three Star Gasoline

Hamilton, Ont.	16.5	6	22.5	25.5	15.5
Toronto, Ont.	16.5	6	22.5	25.5	15.5
Brandon, Man.	22	7	29	32.5	20.5
Winnipeg, Man.	19	7	26	29.5	17.5
Regina, Sask.	23	6	29	33	21.5
Saskatoon, Sask.	25	6	31	35	23.5
Edmonton, Alta.	23.5	6	29.5	33.5	22.5
Calgary, Alta.	20	6	26	30	19
Vancouver, B. C.	19.5	7	26.5	29.5	22.5
Montreal, Que.	16	6	22	25	15
St. John, N. B.	17.5	7	24.5	28.5	20.5
Halifax, N. S.	17.5	6	23.5	27.5	20.5

Aviation Gasoline Prices

Following are tank wagon prices of aviation gasoline in principal marketing territories. Tax column includes 1c federal tax, and state tax; also municipal taxes as indicated in footnotes.

S. O. NEW JERSEY

Prices in Effect May 15, 1933

	Stanavo Aviation Gasoline		
	T.W.	Tax	Total T.W.
Newark, N. J.	16	1	17
Baltimore, Md.	16	5	21
Washington, D. C.	16.3	3	19.5

Discounts: to dealers and contract consumers, 2c per gal. off posted t.w. price.

COLONIAL BEACON OIL CO.

	Stanavo Aviation Gasoline		
New York City	16	4	20
Boston, Mass.	17	4	21

S. O. PENNSYLVANIA

	Stanavo Aviation Gasoline		
Philadelphia, Pa.	12.5	4	16.5
Pittsburgh, Pa.	15	4	19
Altoona, Pa.	15	4	19
Harrisburg, Pa.	12.5	4	16.5

Discounts: to dealers and contract consumers 2c per gal. off posted t.w. price.

S. O. OHIO

	Stanavo Aviation Gasoline		
Thru Ohio	15	5	20

Discounts: to airports, 1 to 4c, based on quantity.

S. O. INDIANA

	Stanavo Aviation Gasoline		
	T.W.	Tax	Total T.W.
Chicago, Ill.	14.1	4	18.1
Indianapolis, Ind.	14.4	5	19.4
Detroit, Mich.	14.8	4	18.8
Milwaukee, Wisc.	14.3	5	19.3
Minneapolis, Minn.	15.4	4	19.4
St. Louis, Mo.	13.6	3	16.6
Kansas City, Mo.	14.1	*4	18.1
Fargo, N. D.	17.1	4	21.1
Huron, S. D.	15.5	5	20.5
Wichita, Kans.	13	4	17

*Includes 1c city tax.

S. O. LOUISIANA

	Stanavo Aviation Gasoline		
Little Rock, Ark.	18	7	25
New Orleans, La.	17	*7	24
Shreveport, La.	17	6	23
Chattanooga, Tenn.	20	8	28
Memphis, Tenn.	18	8	26

Dealer and commercial consumer discount: 2c off posted retail t.w.
*Includes 1c parish tax.

	Magnolia Petroleum		
Dallas, Tex.	10	5	15

CONTINENTAL OIL CO.

	Conoco Aviation Gasoline		
Denver, Colo.	12	5	17
Cheyenne, Wyo.	14	5	19
Helena, Mont.	18	6	24
Salt Lake City, Utah	14	5	19
Albuquerque, N. M.	13	6	19
Boise, Ida.	15.5	6	21.5

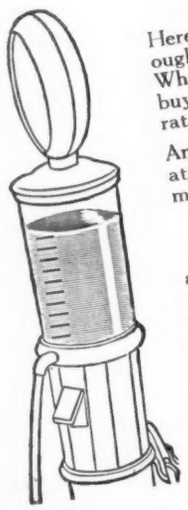
S. O. CALIFORNIA

	Stanavo Aviation Gasoline		
Phoenix, Ariz.	15	6	21
Los Angeles, Cal.	13	4	17
San Francisco, Cal.	14.5	4	18.5
Reno, Nev.	16.5	5	21.5
Portland, Ore.	13.5	5	18.5
Seattle, Wash.	13.5	6	19.5
Spokane, Wash.	16.5	6	22.5

Note: Above prices are in tank trucks or iron barrels. For deliveries direct into airplane fuel tanks, 3c per gal. additional.

PREMIUM GASOLINE
OF YESTERDAY

Regular Gasoline of today!



Here is a fact that every gasoline distributor ought literally to shout at every customer. Who would have said that today we would be buying gasoline with a 60 to 70 octane rating as just *regular* gasoline.

And this is the gasoline you should make attractive in appearance as a part of your merchandising plan. Color is your means.

DYKEM COLORS

are available in such a wide range that you can color your gasoline almost any shade you prefer. There is a Dykem Color—or a combination of Dykem Colors—that will aid you in distinguishing your regular gasoline.

May we be at your service.
Write for samples and prices.

DYESTUFFS & CHEMICALS, INC.
11th & Monroe Sts., St. Louis, Mo.

In Canada: The Dykem Company of Canada Limited
14 Toronto St., Toronto, Ont.

Naphtha Prices

Prices in Effect May 15, 1933

	Oleum Spirits	V.M.&P. Naphtha	Cleaner Naphtha
Chicago	11.7	13.7	13
Detroit	15.4	16	16.5
Kansas City	†13	†14.5	†15.3
Milwaukee	*17.5	*19	*19.8
Minneapolis	**17.8	**19.3	**20.1
St. Louis	12.7	14.2	15
New York	...	12	15
Boston	...	16	16
Philadelphia	...	15	..

*Includes 4c state tax. †Includes 1c city tax.
**Includes 3c state tax.

Petroleum Spirits (Solvent)

Tank Cars (F.o.b. refinery or seaboard terminal)	
New York Harbor	8.50
Philadelphia district	8.50
Providence	8.50
Tank Wagon or Steel Barrels	
New York City	12
Syracuse	15
Rochester	14
Buffalo (net price)	13
Providence	16
Boston	16
Bridgeport	16
Newark	12
Philadelphia	12
Lancaster	17
Altoona	17
Baltimore	*14

Note: 2c off above t.w. prices to large buyers in some instances. *4c discount allowed on 200 gal. or more in Baltimore only, with 1c premium for steel barrels.

Fuel Oil

Following are tank wagon prices of various grades of fuel oil at the points shown in various territories. Prices are in cents per gallon:

Prices in Effect May 15, 1933

	No. 1	No. 2	No. 3	No. 4
S. O. New Jersey				
Newark, N. J.	8	6.5	....	6
Atlantic City, N. J.	8	6.5	....	6
Baltimore, Md.	8	6.50	....	5
Washington, D. C.	8.25	6.75	....	6.25
S. O. New York				
New York City	7.5	6.5	6.5	5.5
Albany, N. Y.	7.5	6.5	6.5	5.5
Rochester, N. Y.	7.5	6.5	6.5	5.5
Boston, Mass.	7.5	6.5	6.5	5.5
Augusta, Me.	8	6.5	6.5	5.5
Manchester, N. H.	8	6.5	6.5	5.5
Burlington, Vt.	7.5	6.5	6.5	5.5
New Haven, Conn.	7.5	6.5	6.5	5.5
Providence, R. I.	7.5	6.5	6.5	5.5
Atlantic Refining				
Philadelphia, Pa.	7.5	6	6	5.5
Allentown, Pa.	8.5	7	7	....
Wilmington, Del.	8	6.5	6	....
Springfield, Mass.	7.5	6.5	6.5	....
Worcester, Mass.	7.5	6.5	6.5	....
Hartford, Conn.	7.5	6.5	6.5	....
S. O. Ohio				
Cleveland	7.5	6.5	6	....
Columbus	7.5	6.75	6.25	....
Cincinnati	7.5	6.75	6.25	....
Toledo	7.5	6.75	6.25	....

Note: S. O. Ohio prices are for hose dumps; bucket dumps are 0.5c per gallon higher.

S. O. Indiana
Stanolex Fuel Oil No. 1

Chicago, Ill.	7.25
Indianapolis, Ind.	*11.7
Detroit, Mich.	8
Madison, Wis.	7.4
Minneapolis, Minn.	7.9
Sioux City, Ia.	8.6
St. Louis, Mo.	6.2
Kansas City, Mo.	6.7

*Includes state tax of 4c.
Discounts: at Chicago, Indianapolis and Detroit, 2c off t.w. price for deliveries of 100 gals. and over; at other above points, 2c off t.w. price for deliveries 50 gals. and over.

Compilation Of Mid-Continent Refinery Operations

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Mid-Continent Refinery Operations, Week Ended May 12 (By Teletype)

	Kansas	Oklahoma	North & Cent. Texas	West Texas	North La.-Ark.	Total Week Ended May 12
Plants Operating.....	10	23	23	10	10	76
Da. Av. Cap. Bbls....	94,000	162,500	107,400	71,500	60,700	496,100
Da. Cracking Capacity	53,200	64,600	23,100	26,250	31,700	198,850
Da. Av. Crude Runs..	57,398 — 13.7	70,921 + 4.9	35,893 + 21.9	17,335 +143.3	29,011 — 5.3	210,558 + 4.1
Da. Av. Other Oil....	8,357 — 18.1	6,441 + 13.3	1,363 — 56.1	.....	18,916 + 21.1	35,077 — 2.4
GASOLINE—Gallons						
Stocks, May 5.....	30,112,000	46,309,000	29,567,000	3,349,000	8,841,000	118,178,000
Prod. 5-5 to 5-12.....	9,888,000 — 18.9	12,792,000 + 11.0	6,256,000 + 4.3	1,669,000 +100.1	5,100,000 — 3.8	35,705,000 — 0.4
Ship. 5-5 to 5-12.....	10,711,000 — 14.9	13,799,000 + 14.1	7,820,000 + 10.3	2,312,000 + 95.2	5,697,000 + 19.3	40,339,000 + 6.9
Stocks, May 12.....	29,289,000 — 2.7	45,302,000 — 2.2	28,003,000 — 5.3	2,706,000 — 19.2	8,244,000 — 6.8	113,544,000 — 3.9
Ratio Sales to Prod...	108.3%	107.9%	125.0%	138.5%	111.7%	113.0%
KEROSINE—Gallons						
Stocks, May 5.....	5,613,000	3,600,000	568,000	.....	513,000	10,294,000
Prod. 5-5 to 5-12.....	2,701,000 + 10.5	1,804,000 + 6.7	530,000 + 82.1	....	458,000 + 3.2	5,493,000 + 12.3
Ship. 5-5 to 5-12.....	2,577,000 — 32.6	1,825,000 — 5.4	363,000 + 21.4	....	535,000 + 18.1	5,300,000 — 19.7
Stocks, May 12.....	5,737,000 + 2.2	3,579,000 — 0.6	735,000 + 29.4	....	436,000 — 15.0	10,487,000 + 1.9
Ratio Sales to Prod...	95.4%	101.2%	68.5%	.....	116.8%	96.5%
STOVE DISTILLATE—Gallons						
Stocks, May 5.....	850,000	1,697,000	130,000	.....	59,000	2,736,000
Prod. 5-5 to 5-12.....	561,000 + 50.0	617,000 + 5.3	36,000 + 33.3	....	63,000 — 36.0	1,277,000 + 21.2
Ship. 5-5 to 5-12.....	339,000 + 7.3	510,000 — 26.9	5,000	....	64,000 — 34.0	918,000 — 17.4
Stocks, May 12.....	1,072,000 + 26.1	1,804,000 + 6.3	161,000 + 23.8	....	58,000 — 1.7	3,095,000 + 13.1
Ratio Sales to Prod...	60.4%	82.7%	13.9%	.....	101.6%	71.9%
GAS OIL—Gallons						
Stocks, May 5.....	4,318,000	19,812,000	8,640,000	50,000	4,559,000	37,199,000
Prod. 5-5 to 5-12.....	1,019,000 — 3.4	286,000	—274,000	364,000 + 43.9	2,366,000 + 23.4	3,761,000 + 58.3
Ship. 5-5 to 5-12.....	743,000 + 46.2	531,000 +258.7	161,000 +600.0	....	1,562,000 — 16.9	2,997,000 + 4.5
Stocks, May 12.....	4,414,000 + 6.7	19,567,000 — 1.2	8,205,000 — 5.0	414,000 +728.0	5,363,000 + 17.6	37,963,000 + 2.1
Ratio Sales to Prod...	72.9%	185.7%	.....	.....	66.0%	79.7%
FUEL OIL—Gallons						
Stocks, May 5.....	11,161,000	44,812,000	62,818,000	8,392,000	13,412,000	140,595,000
Prod. 5-5 to 5-12.....	4,562,000 — 9.4	3,135,000 + 1.6	2,687,000 — 13.8	2,873,000 +114.7	2,884,000 — 0.7	16,141,000 + 4.3
Ship. 5-5 to 5-12.....	3,637,000 — 6.9	4,688,000 + 19.3	2,911,000 — 7.9	4,138,000 +333.3	2,669,000 — 31.5	18,043,000 +13.9
Stocks, May 12.....	12,086,000 + 8.3	43,259,000 — 3.5	62,594,000 — 0.4	7,127,000 — 15.1	13,627,000 + 1.6	138,693,000 — 1.4
Ratio Sales to Prod...	79.7%	149.5%	108.3%	144.0%	92.5%	117.8%

Gasoline Produced by Various Methods, Week Ended May 12

	Kansas	% of Total	Oklahoma	% of Total	North & Cent. Texas	%of Total	West Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run.....	3,885,000	39.3	7,061,000	55.2	2,671,000	42.7	1,578,000	94.5	2,155,000	42.3	17,350,000	48.6
Cracked.....	5,366,000	54.3	4,462,000	34.9	3,111,000	49.7	89,000	5.3	2,659,000	52.1	15,687,000	43.9
Natural.....	637,000	6.4	1,269,000	9.9	474,000	7.6	2,000	0.2	286,000	5.6	2,668,000	7.5
Total.....	9,888,000		12,792,000		6,256,000		1,669,000		5,100,000		35,705,000	

+ or — columns are % change over previous week.

Gasoline Stocks Drop 4,600,000 Gallons as Shipments Gain

Staff Special—By Teletype
TULSA, May 15

GASOLINE shipments gained 2,600,000 gallons from 76 Mid-Continent refineries the week ended May 12, as production remained steady with the result that gasoline stocks were lowered 4,600,000 gallons. All districts shared in the stock reduction.

Crude runs were 8200 barrels higher on daily average, but runs of other oils were slightly lower and production of other major commodities increased, which accounts for no gain in gasoline output.

Stocks of kerosine, furnace oil and gas oil increased. Kerosine shipments were almost 1,000,000 gallons higher. Furnace oil shipments dropped, while gas oil shipments showed slight gain. Fuel oil stocks were reduced as a result of a sizable gain in shipments.

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended May 12. Change in stocks figured from April 14.

GASOLINE

	Gallons
Production	144,276,000
Shipments	159,885,000
Net change in stocks	—15,609,000
Ratio sales to production	110.8%

KEROSINE

	Gallons
Production	20,243,000
Shipments	20,881,000
Net change in stocks	—683,000
Ratio sales to production	103.2%

FURNACE OIL

	Gallons
Production	4,514,000
Shipments	4,307,000
Net change in stocks	+207,000
Ratio sales to production	95.4%

GAS OIL

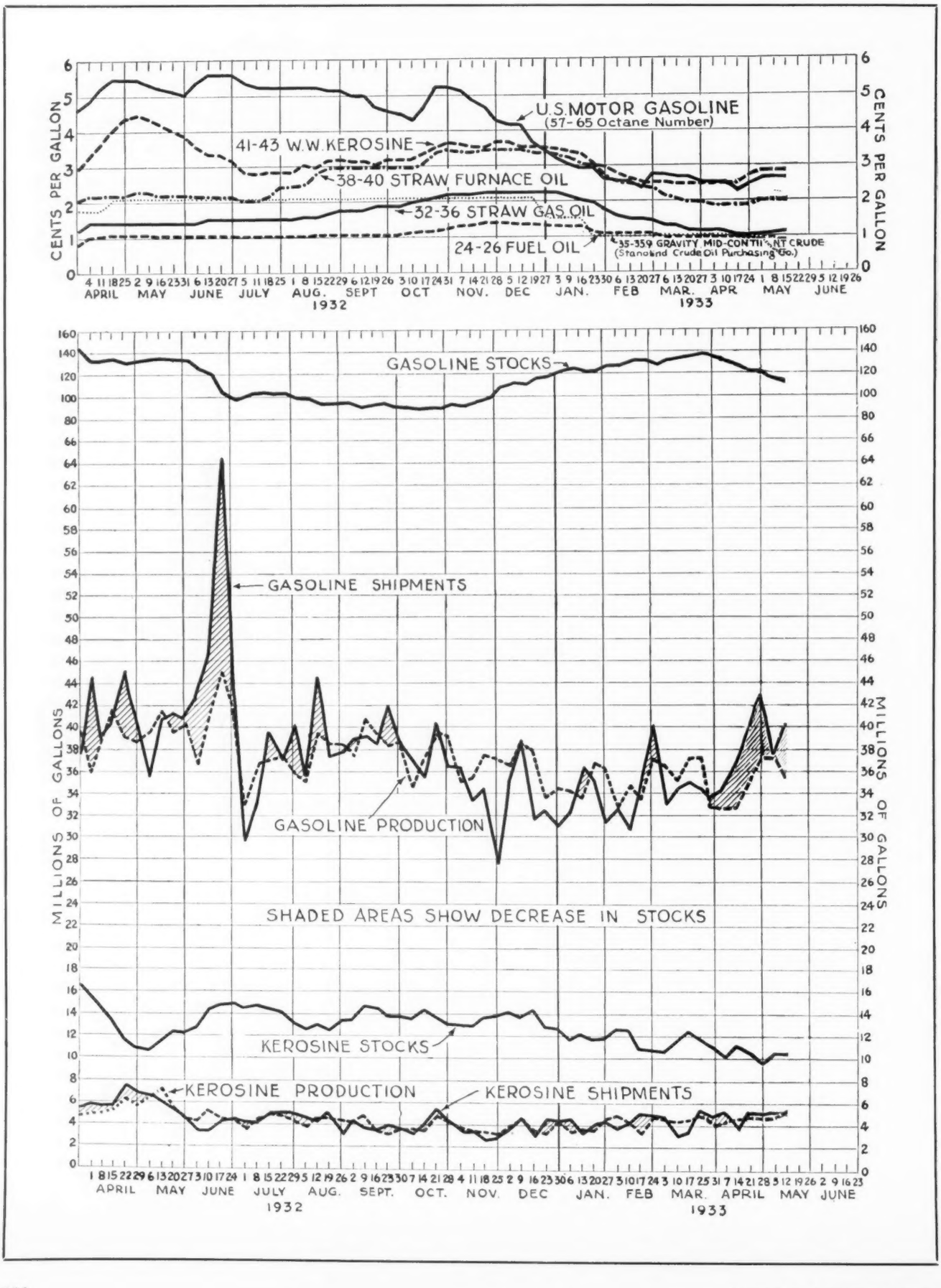
	Gallons
Production	15,037,000
Shipments	14,381,000
Net change in stocks	+656,000
Ratio sales to production	95.6%

FUEL OIL

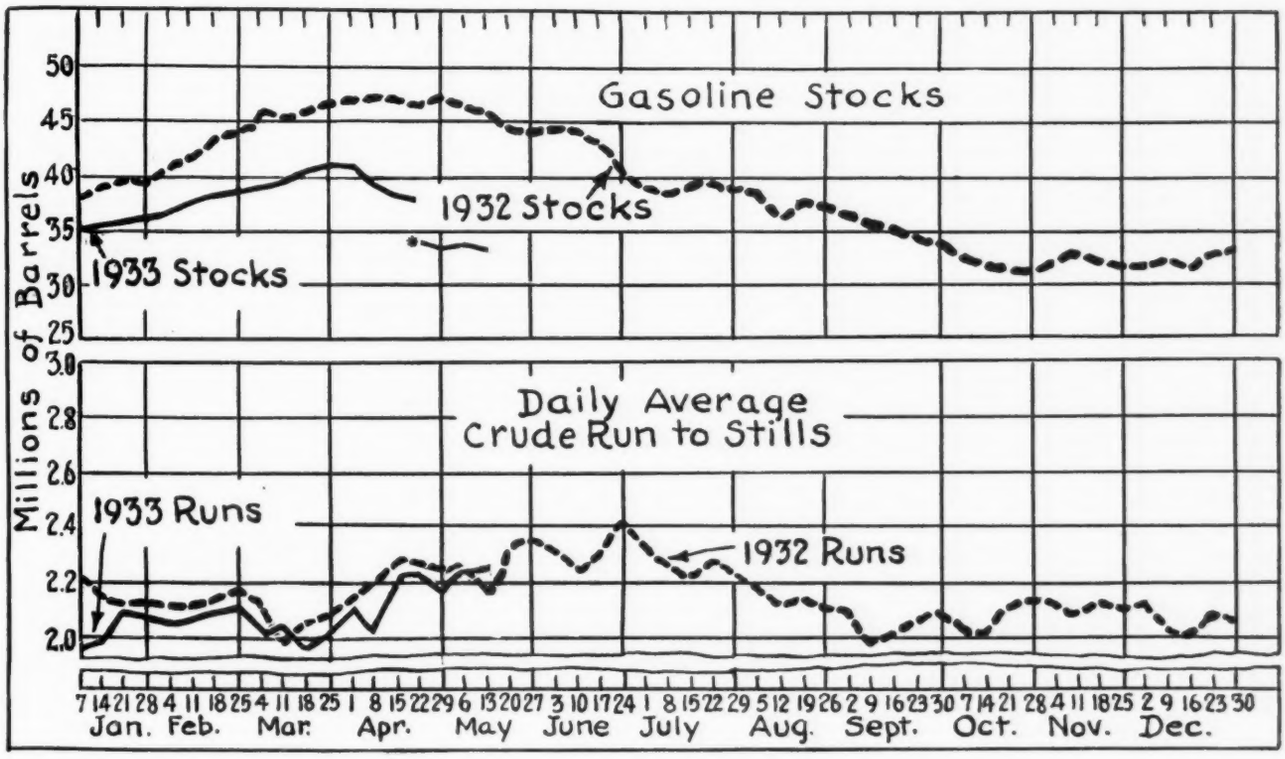
	Gallons
Production	63,138,000
Shipments	65,812,000
Net change in stocks	—2,674,000
Ratio sales to production	104.2%

Barometer of Mid-Continent Refinery Market—Week Ending May 12

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, from Reports Made by 76 Plants to National Petroleum News



U. S. Crude Runs and Gasoline Stocks as Reported Weekly by A. P. I.



*Method of reporting changed.

Bulk Motor Fuel Stocks Cut 222,000 Barrels in Week

By Telegraph

NEW YORK, May 16

BULK motor fuel stocks were reduced 222,000 barrels to 56,719,000 barrels in the week ended May 13, according to reports gathered by the American Petroleum Institute from plants with 91.6 per cent of the total refining capacity of the country.

Stocks of gasoline at refineries were reduced 889,000 barrels to 32,880,000 barrels but bulk terminal, pipeline and in-transit stocks rose 662,000 barrels to 20,334,000 barrels.

Crude runs to stills were largely unchanged, increasing only 5000 barrels daily average to 2,243,000 barrels. Reporting refiners utilized 63.5 per cent of still capacity as compared with 63.4 per cent the previous week. Cracking operations increased during the week, production of cracked gasoline rising 20,000 barrels daily average to 478,000 barrels per day.

Largest reductions in refinery gasoline stocks were reported by coastal groups. East Coast refiners drew 260,000 barrels from storage, Gulf Coast refiners 322,000 barrels and California refiners 247,000 barrels. Mid-Continent and Indiana-Illinois refiners also reported substantial drains on storage.

East Coast, Gulf Coast, Indiana-Illinois and Appalachian refiners were operating at the highest percentage of capacity, each utilizing more than 70 per cent of capacity. Texas Gulf refiners led the list with 82.7 per cent of capacity.

Fuel and gas oil stocks rose 155,000 barrels to 123,308,000 barrels.

Current Refinery Operations

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks (Thousands of Barrels) Gasoline		Gas & Fuel Oil		% of Total Capacity Reporting	Cracked Gasoline Production Daily Av. Production (Barrels) Week Ended	
		May 13	May 6	May 13	May 6	May 13	May 6	May 13	May 6		May 13	May 6
East Coast	99.1	483,000	477,000	75.6	74.7	5,977	6,237	6,405	6,222	94.8	86,000	81,000
Appalachian	95.0	97,000	83,000	71.9	61.5	1,479	1,464	876	852	97.5	29,000	27,000
Ind., Ill., Ky.	97.5	310,000	301,000	73.1	71.0	5,926	5,972	3,689	3,637	96.1	101,000	102,000
Okla., Kans., Mo.	84.9	214,000	228,000	54.9	58.5	3,294	3,354	3,057	3,095	92.5	54,000	56,000
Inland Texas	56.4	92,000	69,000	51.8	38.8	1,160	1,227	2,134	2,092	81.1	22,000	18,000
Texas Gulf	97.7	448,000	463,000	82.7	85.4	5,203	5,477	6,035	5,982	97.8	98,000	88,000
La. Gulf	97.3	103,000	98,000	72.5	69.0	1,185	1,233	1,920	1,850	100.0	19,000	20,000
No. La., Ark.	88.5	39,000	37,000	49.4	46.8	218	214	591	567	86.4	9,000	9,000
Rocky Mt.	90.8	36,000	32,000	26.1	23.2	1,290	1,196	641	624	95.4	12,000	11,000
California	94.6	421,000	450,000	48.6	52.0	7,148	7,395	97,960	98,232	100.0	48,000	46,000
Total	91.6	2,243,000	2,238,000	63.5	63.4	32,880	33,769	123,308	123,153	95.4	478,000	458,000

Complete Seaboard Markets

Prices on this page do not include federal tax levied on some products

Eastern Domestic Markets

(Prices for tank car lots, f. o. b. refinery or seaboard terminal, representing majority of sales and quotations to jobbers and/or consumers. Florida and S. Carolina inspection tax not included.

	Prices May 15	Prices May 8	Prices May 1
U. S. MOTOR GASOLINE: Below 65 Octane Number			
New York harbor	4.25 – 4.50	4.25 – 4.50	4.50 – 4.75
Portland district	5.25	5.25 – 5.50	5.25 – 5.50
Boston district	4.75	4.75 – 5.00	4.75 – 5.00
Providence district	4.75	4.75 – 5.00	4.75 – 5.00
Philadelphia district	4.25 – 4.50	4.50	4.50 – 4.75
Baltimore district	4.00 – 4.25	4.25 – 4.50	4.50 – 4.75
Norfolk district	4.50 – 4.75	4.50 – 5.00	4.75 – 5.00
Charleston district	4.75	4.75 – 5.00	4.75 – 5.00
Savannah district	4.75	4.75 – 5.00	4.75 – 5.00
Jacksonville district	4.75	4.75 – 5.00	4.75 – 5.00
MOTOR GASOLINE: 65 Octane Number and Above			
New York harbor	4.50 – 4.75	4.50 – 4.75	4.75 – 5.00
Portland district	5.50	5.50 – 5.75	5.50 – 5.75
Boston district	5.00	5.00 – 5.25	5.00 – 5.25
Providence district	5.00	5.00 – 5.25	5.00 – 5.25
Philadelphia district	4.50 – 4.75	4.75	4.75 – 5.00
Baltimore district	4.25 – 4.75	4.25 – 4.75	4.75 – 5.00
Norfolk district	4.75 – 5.00	4.75 – 5.00	5.00 – 5.25
Charleston district	5.00	5.00 – 5.25	5.00 – 5.25
Savannah district	5.00	5.00 – 5.25	5.00 – 5.25
Jacksonville district	5.00	5.00 – 5.25	5.00 – 5.25
AVIATION GASOLINE: Below 73 Octane Number			
New York harbor	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
Philadelphia	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
Baltimore	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
Boston	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
73 Octane Number and Above (Test basis 300° F.; 600 R.P.M.)			
New York harbor	11.00 –12.00	11.00 –12.00	11.00 –12.00
Philadelphia	11.00 –12.00	11.00 –12.00	11.00 –12.00
Baltimore	11.00 –12.00	11.00 –12.00	11.00 –12.00
Boston	11.00 –12.00	11.00 –12.00	11.00 –12.00
WATER WHITE KEROSINE			
New York harbor	4.75 – 5.00	5.00	5.00 – 5.25
Philadelphia district	5.00	5.00	5.50
Baltimore district	5.00	5.00	5.50
Norfolk district	5.00	5.00	5.25
Charleston district	5.00	5.00	5.25
Boston district	5.00	5.00 – 5.25	5.00 – 5.25
Savannah district	5.00	5.00	5.25
Jacksonville district	5.00	5.00	5.25
Portland district	5.25	5.25 – 5.50	5.25 – 5.50
Providence district	4.75 – 5.00	5.00 – 5.25	5.00 – 5.25
BURNING OILS:			
New York harbor:			
Furnace oil No. 1	5.00	5.00	5.00
Furnace oil No. 2	4.00	4.00	4.00
Distillate oil No. 3	4.00	4.00	4.00
Industrial oil No. 4	3.50	3.50	3.50
Philadelphia district:			
Furnace oil No. 1	5.00	5.00	5.00
Furnace oil No. 2	4.00	4.00	4.00
Distillate oil No. 3	3.50	3.50	3.50
Industrial oil No. 4	3.50	3.50	3.50
Boston district:			
Furnace oil No. 1	5.25	5.25	5.25
Furnace oil No. 2	4.25	4.25	4.25
Distillate oil No. 3	3.75	3.75	3.75
Industrial oil No. 4	3.50	3.50	3.50

	Prices May 15		
	*Bunker Oil Grade C	Diesel Oil Ships' Bunkers	Gas Oil 28-34 Gravity
New York Harbor	$0.75	†$1.65	4.00
Philadelphia district	0.75	1.65	4.00
Baltimore district	0.75	1.65	4.00
Norfolk district	0.75	1.65	....
Charleston district	0.70	1.65	....
Savannah district	0.70	†1.65	....
Jacksonville district	0.70	†1.65	....
Portland district	0.80	1.75	....
Boston district	0.75	1.65	....
Providence district	0.75	1.65	....

*Lighterage 5c per bbl. additional. †At shore plants, 4c per gal.

New York Export Markets

(Prices in cents per gallon in barrels, F. a. s. New York)

CYLINDER OILS (Pennsylvania Products)			
Bright stock, No. 8 color	24.00 –24.50	24.00 –24.50	24.00 –24.50
Bright stock, No. 6½ color diluted	23.00 –23.50	23.00 –23.50	23.00 –23.50
600 Warren E filtered	19.00	19.00	19.00
600 stm. refd, unfiltered	14.50	14.50	14.50
650 stm. refd. unfiltered	16.50	16.50	16.50
600 flash steam refined	17.00	17.00	17.00
630 flash, steam refined	23.50	23.50	23.50

Wax Market

(Prices in cents per pound. Tests made by A. S. T. M. method with melting points converted into A. M. P. by adding 3° F. Export prices are f.a.s. carload lots. Domestic prices are f.o.b. refineries in New York and New Orleans harbor district, in bags, carload lots, with 0.2c discount allowed for shipment in bulk).

	Prices May 15	
NEW YORK	**Domestic**	**Export**
124-126 Yellow Crude scale	2.00	2.00
122-124 White Crude scale	2.00 – 2.125	2.00 – 2.125
124-126 White Crude scale	2.125– 2.25	2.125– 2.25
123-125 Fully refined	3.10	2.75 – 3.00
125-127 Fully refined	3.20	3.00 – 3.125
128-130 Fully refined	3.45	3.25 – 3.50
130-132 Fully refined	3.60	3.375– 3.50
133-135 Fully refined	4.20	4.00 – 4.375
135-137 Fully refined	4.45	4.375– 4.50

	Prices May 15	
NEW ORLEANS	**Domestic**	**Export**
124-126 Yellow Crude scale	2.00	2.00
122-124 White Crude scale	2.00 – 2.125	2.00 – 2.125
124-126 White Crude scale	2.125– 2.25	2.125– 2.25
123-125 Fully refined	3.10	2.75 – 3.00
125-127 Fully refined	3.20	3.00 – 3.125
128-130 Fully refined	3.45	3.25 – 3.50
130-132 Fully refined	3.60	3.375– 3.50
133-135 Fully refined	4.20	4.00 – 4.375

Gulf Coast Bulk Market

(Prices are f. o. b. Gulf oil terminals representing sellers' opinions except prices specified to the contrary. Prices cover bulk shipments of 20,000 barrels or more, unless otherwise noted.)

	May 15	May 8	May 1
U. S. MOTOR GASOLINE: For Domestic Shipment			
Below 65 octane number	3.00 – 3.25	3.25 – 3.50	3.25 – 3.50
65 octane and above	3.375– 3.50	3.50 – 3.75	3.50 – 3.75
FURNACE OILS			
No. 1 Furnace oil	3.625– 3.75	3.625– 3.75	3.625– 3.75
No. 2 Furnace oil	2.75 – 3.00	3.125– 3.25	3.125– 3.25
KEROSINE			
41-43 w.w.	3.625	3.625	3.625
For Export Shipment			
GASOLINE			
U. S. Motor gasoline	3.00 3.125	3.00 – 3.125	3.125– 3.25
60-62, 400 e.p. gasoline	3.125– 3.25	3.125– 3.25	3.25 – 3.375
61-63, 390 e.p. gasoline	3.25 – 3.375	3.25 – 3.375	3.375– 3.50
64-66, 375 e.p. gasoline	3.25 – 3.375	3.375– 3.50	3.50 – 3.625
U. S. Motor, cases (cargoes)	$1.25	$1.25	$1.25
64-66 cases (cargoes)	$1.35	$1.35	$1.35
KEROSINE			
44 water white	3.75	3.75	3.75
41-43 water white	3.625	3.625	3.625
41-43 prime white	3.50	3.50	3.50
W.W., cases (cargoes)	$1.20	$1.20	$1.20
P.W., cases (cargoes)	$1.15	$1.15	$1.15
For Domestic and/or Export Shipment			
GAS and BUNKER OILS			
*26-30 translucent gas oil	2.75 – 3.00	2.75 – 3.00	2.75 – 3.00
*30 plus translucent gas oil	3.00 – 3.25	3.00 – 3.25	3.00 – 3.25
Diesel Oil ships' bunkers	$1.50	$1.50	$1.50
Grade C bunker oil, for ships' bunkers, per bbl.	$0.60	$0.60	$0.60
Grade C bunker oil, per bbl. in cargoes	$0.55	$0.55	$0.55

*Less than ½ of 1% sulphur.

MEXICAN CRUDE AND BUNKER OILS (f.o.b. Steamer, Tampico)			
Heavy Panuco crude taxes to be paid, per bbl.	$0.40 –$0.43	$0.40 –$0.43	$0.40 –$0.43
Grade C for bunkering, taxes paid, per bbl.	$0.60	$0.60	$0.60
SOUTH TEXAS LUBRICATING OILS (Viscosity at 100° F. cold test 0 Tanker, f. o. b. Gulf oil terminals.)			
200 vis. No. 3 unfilt. pale	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
300 vis. No. 3 unfilt. pale	5.375– 6.00	5.375– 6.00	5.375– 6.00
500 vis. No. 3½ unfilt. pale	6.25 – 7.00	6.25 – 7.00	6.25 – 7.00
750 vis. No. 4 unfilt. pale	7.25 – 7.75	7.25 – 7.75	7.25 – 7.75
1200 vis. No. 4 unfilt. pale	8.50 – 9.00	8.50 – 9.00	8.50 – 9.00
200 vis. No. 5-6 red oil	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
300 vis. No. 5-6 red oil	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
500 vis. No. 5-6 red oil	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00
750 vis. No. 5-6 red oil	6.75 – 7.125	6.75 – 7.125	6.75 – 7.125
1200 vis. No. 5-6 red oil	7.75 – 8.25	7.75 – 8.25	7.75 – 8.25

Note: Red oil prices shown above cover oils with blue cast; one or two refiners ask 0.5c to 1c per gal. higher for green cast red oils.

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

53-55 U. S. Motor	3.50 – 4.00	3.50 – 4.00	3.50 – 4.00
400 e.p. blend 65 Octane and above	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50
Gas oil, 30-34 per bbl.	$0.85 –$0.95	$0.85 –$0.95	$0.85 –$0.95
Diesel oil, 27 plus, per bbl.	$0.85 –$0.90	$0.85 –$0.90	$0.85 –$0.90
Bunker oil, 14-18 per bbl.	$0.60 –$0.72	$0.60 –$0.72	$0.60 –$0.72
Fuel oil, 14-18 per bbl.	$0.50 –$0.60	$0.50 –$0.60	$0.50 –$0.60
38-40 w.w. kero., 150 fire	3.75 – 4.25	3.75 – 4.25	3.75 – 4.25
Cased Goods			
Gasoline, U. S. Motor	$1.45 –$1.60	$1.45 –$1.60	$1.45 –$1.60
Gasoline, 400 e.p. blend	$1.55 –$1.70	$1.55 –$1.70	$1.55 –$1.70
38-40 w.w. kero., 150 fire	$1.25 –$1.35	$1.25 –$1.35	$1.25 –$1.35
Kerosine, prime white	$1.05 –$1.20	$1.05 –$1.20	$1.05 –$1.20

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 pounds, British sterling; to U. S. ports, cents per barrel)

	May 15			
	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Calif.-U.K./Continent*	12/6	15/-20/	15/	15/-19/
Gulf-U.K./Continent*	9/	9/	8/9	9/-10/
Calif.-N. Atlantic (not E. of N. Y.)	42c	40-45c	41c	40-45c
Gulf-N. Atlantic** (not E. of N. Y.)	14	14-16c	14c	15-18c

*Continental ports in range between Bordeaux and Hamburg, both inclusive
**Venezuela loading same rate; Tampico 2 to 3c per bbl additional.

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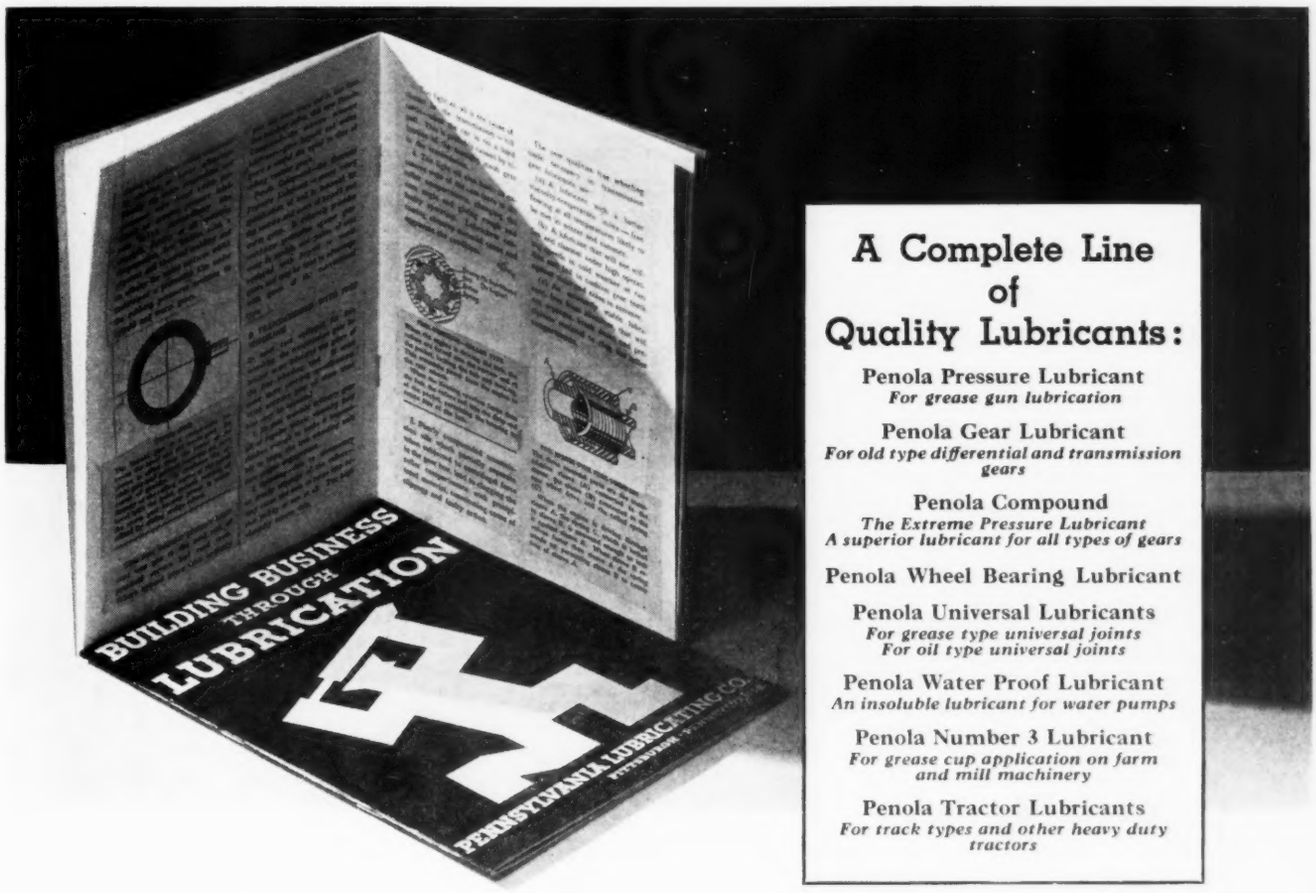

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Refiners' & Compounders' Supplies

Following are average market prices for materials used by refiners and compounders effective on the date shown.

Refiners' Supplies

		May 15	May 8
Soda Ash light 58% bags,	cwt.	$1.125-1.38	$1.125-1.38
Silicate of Soda 60 deg. drums	cwt.	$1.75-1.90	$1.75-1.90
Silicate of Soda 40 deg. drums	cwt.	$0.70-1.00	$0.70-1.00
Sal Soda wks.		$0.90-1.00	$0.90-1.00
Caustic Soda 76% solid	cwt.	$2.55	$2.55
Sulfuric Acid 60 deg. tank cars, f.o.b. shipping point per ton		$11.00-12.50	$11.00-12.50
Sulfur, flowers of	cwt.	$3.10-4.05	$3.10-4.05
Liquid Chlorine, tank cars, wks.	lb.	1.75	1.75

Compounder's Supplies

Vegetable Oils

Linseed carloads, spot	lb.	8.60	8.60
Tanks, spot		8.00	8.00
Soya Bean, Tank, coast	lb.	4.50–4.70	4.50–4.70

Oleic Acid

Distilled, tanks	lb.	5.25	5.25
Distilled, bbls.	lb.	6.125	6.125
Saponified, tanks	lb.	5.50	5.50
Saponified, bbls.	lb.	6.25	6.25

Lard Oils

Prime Winter Strained	lb.	8.00	8.00
Extra Winter Strained	lb.	7.25	7.25
Extra No. 1	lb.	6.75	6.75
No. 1	lb.	6.50	6.50
No. 2	lb.	6.25	6.25
Tallow oil	lb.	6.00	6.00

Neatsfoot Oil

Pure, bbls.	lb.	10.75	10.75
Extra, bbls.	lb.	7.00	7.00
No. 1 bbls.	lb.	6.75	6.75
Cold Pressed	lb.	14.00	14.00

Fish Oils

Menhaden Oil

Light Pressed	gal.	*31–32	*31–32
Light Pressed, tank cars, N. Y.	gal.	*23.50-24	*23.50-24
Yellow bleached	gal.	34.50-35	34.50-35
Whale, extra winter bleached	gal.	60.00	60.00

Naval Stores

Steam distilled turpentine, N. Y.	gal.	44.00	44.00
Steam, distilled turpentine, Savannah	gal.	36.50	36.50
Gum turpentine, N. Y.	gal.	48.50	48.50
Gum turpentine, f.o.b. cars Savannah	gal.	41.00	41.00
Wood Rosin, N. Y.	bbl.	$4.13	$4.13
Wood Rosin F, Savn'h	bbl.	$3.30	$3.30
Gum Rosin B, N. Y.	bbl.	$4.00	$4.00
Gum Rosin B, f.o.b. cars Savannah	bbl.	$2.60	$2.60
Rosin oil, pure	gal.	39–40	39–40
Rosin oil, compounded	gal.	41–43	41–43

Pine Tar

Kiln burnt		$8.00-9.00	$8.00-9.00
Retort	bbl.	$9.50-10.00	$9.50-10.00

Alcohol

Denatured Formula 5, per gal., in bbls., car lots		39.6	39.6

*Nominal.

Crude Oil Prices (in Effect May 15, 1933)

Crude prices for the whole year in OIL PRICE HANDBOOK published annually

(Prices are per barrel at the well; A. P. I. Gravity)

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)

(Effective May 9, 1933 except Corning May 8)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$0.97

Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$0.92

Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....†$0.77

Corning Oil in Buckeye Pipe Lines (Ohio)..$0.50

†For Macksburg oil run previous to March 1, 1932, $0.72, effective May 9, 1933.

Posted by Other Companies

Tide Water Pipe Co., Ltd.:

Bradford-Alleghany district (Penna. and N. Y.) (Effective May 9, 1933).....$1.27

*The Pennzoil Co.: (Effective May 9, 1933)

Penna. Grade Oil in National Transit Lines*$1.22

Ashland Oil & Transportation Co.: (Effective May 9, 1933)

Somerset Oil in Ashland Lines (Kentucky) †$0.35

†Buyers pay 15c premium for Somerset crude.

*The Pennzoil Co. posts $1.22 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other districts range down to $1.17 per bbl. at wells.

MICHIGAN

(Posted by Pure Oil Co.)

Midland, Midland County (May 6, 1933)..$0.75

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective May 9, 1933)

Wooster (May 8).$0.50	Princeton.....$0.47
Lima..... 0.55	Illinois..... 0.47
Indiana..... 0.25	West Kentucky. 0.42

CANADIAN CRUDE

Posted by Imperial Oil Refineries, Ltd.

Western Ontario

(Effective Jan. 18, 1933)

Petrolia.....$1.75

Oil Springs.....$1.82

Alberta

Turner Valley

(Effective Jan. 24, 1933)

40-44.9.....$1.41	Naphtha:
45-49.9..... 1.90	†Clear.....$2.82
50 and above.... 2.41	†Discolored..... 2.58

†Clear naphtha: 22 color; 10 lbs. vapor pressure, 90% recovery, end point, 410° A.P.I. Discolored naphtha: 90% recovery and 10 lbs. vapor pressure.

(Effective Jan. 23, 1933)

Red Coulee.....$0.75

*MID-CONTINENT

Prices of Stanolind Crude Oil Purchasing Co.

Oklahoma, Kansas, North and North Central Texas.....$0.25

*Effective May 3 in Texas and May 6 in Oklahoma-Kansas.

Above prices as posted by Stanolind were met by the following companies on the dates mentioned:

May 2, by Humble in North Texas, Ranger, Mexia, Powell, Boggy Creek, Richland, Wortham, Currie and Moran, Tex.; also Continental Oil in N. Texas.

May 3, Shell Petroleum in Texas, and May 6, in Oklahoma-Kansas.

May 3, The Texas Co. in North and North Central Texas and Oklahoma; also Sinclair.

May 8, Magnolia Petroleum in North and North Central Texas including Burkburnett, Archer, Stephens, Henrietta, Electra, Comanche and Olden; in Central Texas including Mexia, Wortham, Corsicana Light and Panola county.

May 8, Carter Oil and Pure Oil in Oklahoma-Kansas.

Prices of Magnolia Petroleum Co. In Oklahoma

(Effective May 9, 1933)

Below 28.....$0.20	35 and above...$0.25
28-34.9..... 0.23	

In Texas, Magnolia pays same as Stanolind.

PANHANDLE TEXAS

Humble Oil & Refining Co.

(Effective May 2, 1933)

Gray county.....$0.20

Carson-Hutchinson.....$0.18

Above prices met May 3 by The Texas Co., May 2 by Continental Oil, May 8 by Magnolia.

EAST TEXAS

By Humble, Texas Co., Sinclair and Empire..$0.25

By Shell.....$0.10

Effective May 3 by Sinclair and Shell; May 5 by Empire; May 10, by The Texas Co., and May 13 by Humble. Stanolind pays $0.25 effective May 11, 1933.

WEST TEXAS

Humble Oil & Refining Co.

(Effective May 2, 1933)

Pecos, Winkler, Crane, Upton, Crockett, Ector, Howard and Glasscock Counties.....$0.20

May 3, met by The Texas Co.; also by Shell in Howard-Glasscock, Winkler, Upton, Crane and Pecos (excepting Yates shallow pool). For Yates shallow pool in Pecos county, $0.15. May 8, met by Magnolia.

NEW MEXICO

(Effective May 2, 1933)

Lea County (Humble, *Shell and *The Texas Co.) $0.20.

*Shell and Texas Co. on May 3.

Posted by Continental Oil Co.

(Effective May 2, 1933)

Artesia (Eddy County).....$0.20

Jackson (Grant County) and Maljamar....$0.15

Cat Creek, Mont. (Effective Dec. 16).....$0.87

SOUTH and SOUTHWEST TEXAS

(Posted by Humble Oil & Refining Co.)

(Effective May 2, 1933)

Darst Creek....$0.23	Mirando.....$0.25
Salt Flat.....$0.23	Pettus, Bee Cty.$0.35
Conroe, Montgomery county.....$0.30	

Above prices met May 3 by The Texas Co. in Darst Creek and Conroe; Texas Co. also posted $0.30 for Saxet and $0.25 in Duval county. May 3, Shell met Humble in Salt Flat. May 8, Magnolia met in Mirando and Darst Creek and posted Luling and Corsicana heavy at $0.20 and Lytton Springs at $0.25.

CALIFORNIA CRUDE

Standard Oil Co. of California

(All gravities above those quoted take highest price offered in the field)

Effective March 5, 1933

Gravity	Signal Hill	Seal Beach Alamitos Heights	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Elwood Terrace	Torrance	Richfield	Whittier La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway Sunset Elk Hills Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge	Ventura Avenue (Associated Oil Co.)	Santa Paula (Union Oil Co.)	Orcutt (Union Oil Co.)
14-14.9	$0.55	$0.55	$0.55	$0.55	$0.55	$0.55	....	....	$0.55	$0.55	$0.55	$0.55	$0.55	....	$0.49	$0.49	$0.49	$0.49	$0.49	....	$0.55	....
15-15.9	.55	.55	.55	.55	.55	.55	....	....	.55	.55	.55	.55	.55	....	.49	.49	.49	.49	.49	....	.55	....
16-16.9	.55	.55	.55	.55	.55	.55	....	....	.55	.55	.55	.55	.55	....	.49	.49	.49	.49	.49	....	.55	$0.49
17-17.9	.55	.55	.58	.58	.58	.58	....	....	.57	.56	.57	.55	.55	....	.49	.49	.50	.49	.49	....	.55	.49
18-18.9	.57	.55	.61	.61	.60	.61	....	....	.59	.58	.59	.55	.57	....	.49	.49	.52	.49	.49	....	.55	.49
19-19.9	.59	.57	.63	.64	.62	.64	....	....	.61	.61	.61	.55	.59	....	.49	.49	.54	.49	.49	....	.55	.49
20-20.9	.61	.59	.64	.67	.64	.66	....	....	.62	.63	.63	.55	.61	....	....	.52	.56	.49	.49	....	.56	.52
21-21.9	.63	.62	.66	.69	.66	.68	....	....	.64	.66	.65	.55	.63	$0.57	....	.55	.58	.51	.50	....	.57	.55
22-22.9	.65	.64	.68	.71	.69	.70	....	....	.66	.68	.67	.57	.65	.59	....	.57	.60	.53	.52	$0.58	.58	.57
23-23.9	.67	.67	.70	.73	.71	.72	....	....	.68	.70	.69	.60	.67	.62	....	.60	.62	.55	.54	.60	.59	.60
24-24.9	.69	.69	.72	.75	.73	.73	$0.65	F.O.B. Ship	.70	.73	.71	.62	.69	.64	....	.63	.63	.57	.56	.62	.60	.63
25-25.9	.71	.72	.74	....	.75	.75	.68		.72	.75	....	.65	.71	.66	....	.66	.65	.59	.58	.64	.61	.66
26-26.9	.73	.74	.75	....	.77	.77	.70	....	.73	.77	....	.68	.72	.69	....	.68	.67	....	....	.66	.63	.68
27-27.9	.75	.76	.77	....	....	.79	.73	....	....	.80	....	....	.74	.71	....	.71	.69	....	....	.68	.65	....
28-28.9	.77	.79	.79	....	....	.81	.75	....	....	.82	....	....	.76	.73	....	.74	.71	....	....	.70	.67	....
29-29.9	.79	.81	.81	....	....	....	.78	....	....	.84	....	....	.78	.76	....	.76	.73	....	....	.72	.69	....
30-30.9	.81	.84	.83	....	....	....	.81	....					.80	.78	....	.79	.75	....	....	.74	.71	....
31-31.9	....	....	....	....	....	....	.83	....					.82	.80	....	.82	....	....	....	....	....	....
32-32.9	....	....	....	....	....	....	.86	....			Kettleman Hills		.84	.83	....	.85	....	....	....	....	....	....
33-33.9	....	....	....	....	....	....	....	$0.83	....	....	$0.66	....	.86	.85	....	.87	....	....	....	....	....	....
34-34.9	....	....	....	....	....	....	....	.85	....	....	.68	....	.88	.87	....	....	....	....	....	....	....	....
35-35.9	....	....	....	....	....	....	....	.87	....	....	.70	....	....	.90	....	....	....	....	....	....	....	....
36-36.9	....	....	....	....	....	....	....	.89	....	....	.72	....	....	.92	....	....	....	....	....	....	....	....
37-37.9	....	....	....	....	....	....	....	.91	....	....	.74	....	....	.94	....	....	....	....	....	....	....	....
38-38.9	....	....	....	....	....	....	....	....	....	....	.76	....	....	.96	....	....	....	....	....	....	....	....
39-39.9	....	....	....	....	....	....	....	....	....	....	.78	....	....	....	....	....	....	....	....	....	....	....

Subject to Field Gathering Charge of 5c per Bbl.

SKILLED SUPERVISION

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COASTAL AND PARAFFINE CRUDES
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NORTH LOUISIANA-ARKANSAS
Prices of Standard Oil Co. of Louisiana
(Effective May 6, 1933)

Caddo, Homer, Haynesville, Sabine, DeSoto, El Dorado, Sarepta and Carterville.....$0.25
Smackover (Jan. 20, 1933).....$0.20
Urania, La. (La. Oil Refg. Corp., May 6, 1933) $0.15

May 3, The Texas Co. posted flat price of $0.25 for all N. La. crude; and $0.20 for Smackover.

S. O. La. prices met as follows: May 6, Gulf Refg. Co. of La. in Caddo, Homer, Haynesville, Bull Bayou, Crichton, DeSoto and El Dorado; also La. Oil Refg. Corp.

***GULF COASTAL**
Posted by Humble Oil & Refining Co.
(Effective May 2, 1933)

All Gulf Coastal.....$0.30

May 3, The Texas Co. posted same price as Humble. *Includes these fields: Barbers Hill, Goose Creek, Hull, Humble, Liberty, Moss, Bluff, Orange, Pierce Junction, Rabbs Ridge, Raccoon Bend, Refugio light and heavy, Sour Lake, Spindletop, Sugarland and West Columbia.

ROCKY MOUNTAIN FIELDS
(Posted by Stanolind Oil & Gas Co.)
(Effective May 6, 1933)

Salt Creek, Wyo.....$0.25

(Stanolind Oil & Gas Co.)
Hogback, N. Mex. (Effective Jan. 18, 1933)..$0.65

(Posted by Ohio Oil Co.)
(Effective Dec. 16, 1932)

Elk Basin, Wyo.....*$0.87
Grass Creek Light..... 0.87
Lance Creek..... 0.92

(Effective Jan. 24, 1933)

Rock Creek.....$0.46
Big Muddy..... 0.50

(Effective Nov. 7, 1932)

Sunburst, Mont.....$0.75

*Stanolind Oil & Gas is paying $0.62 for Elk Basin and Grass Creek light, effective Jan. 18, 1933.

Crude Price Changes

ASHLAND, Ky.—May 9 Ashland Oil & Transportation Co. cut Somerset, Ky., crude 10 cents, to new price of $0.35 per barrel. Buyers continue to pay 15 cent premium for this oil, giving the producers a price of $0.50.

CHICAGO.—May 6 Pure Oil Co. cut Midland, Mich., crude 20 cents, to new price of $0.75 per barrel.

NEW YORK.—May 9 The Texas Co. extended the flat price of $0.25 for all grades of crude into Oklahoma fields.

HOUSTON.—May 13 Humble Oil & Refining Co. posted East Texas crude at $0.25 per barrel. On May 2 the Humble had discontinued posting a price for this crude.

May 10 The Texas Co. advanced East Texas crude 15 cents, to new price of $0.25. This price was met May 11 by Stanolind Crude Oil Purchasing Co.

Eldred Refining Has Meeting

AUBURN, N. Y., May 12.—A dinner and sales meeting of the Eldred Refining Co. of N. Y., Inc., was held at the main offices of the company here May 8. The company is the New York sales organization of the Pennsylvania Oil Products Refining Co., Warren, Pa.;, of which M. F. Cowden is president. The latter operates a 1000-barrel refinery at Eldred, Pa.

J. A. Keller, general manager of the Eldred company, introduced the speaker of the evening, H. S. Hayden general manager of the parent company.

On The Lazy Bench

The Ball Player

'Twas midnight—

"Wow! Wow WOW!!!" came weird noises from the crib.

The ballplayer-father poised on the edge of the bed:

"Four bawls and I walk," he murmured.

—The National Dixie Booster, Dixie Distributors, Inc.

* * *

Walter Winchell tells in his column of a celebrity who was being shown through an ocean liner by the captain. Presently they came to a room wherein were stored a supply of sky rockets.

"What do you do with those?" asked the visitor.

"We send them up when the ship is in distress," answered the captain.

"Pardon my suggesting it," said the celebrity, "but isn't that a heluva time to celebrate?"

—Marquette Lubricator, Marquette Petroleum Products, Inc.

* * *

Newspaper Reporter: "To what do you attribute your great age?"

Very Old Man: "Wall, I can't say yit. Several of them testimonial fellers is dickerin' with me."

—The Diamond, Mid-Continent Petroleum Corp.

* * *

Doomed to Disappointment

"Harry surprised me by telling me we were going to France on our honeymoon."

"How nice, and how did he spring it on you?"

"He said that as soon as we were married he would show me where he was wounded in the war."

—The Oil Can, Illinois Petroleum Marketers Ass'n.

* * *

"Just think, while I was out with some of the fellows the other night, a burglar broke into our house."

"Did he get anything?"

"I'll say he did—my wife thought it was me coming home."

—The Sohioan, The Standard Oil Co. of Ohio.

* * *

Irate Father (Discovering his daughter on young man's lap): "Myra, what does this mean?"

Daughter: "Come back in about 15 minutes, dad, I ought to know by then."

—Electrical News, Petroleum Industry Electrical Assoc.

• • •

Notice in Florida paper: "Thursday I lost a gold watch I valued very highly. Immediately I inserted an ad in your lost and found column and waited. Yesterday I went home and found the watch in the pocket of another suit. God Bless Your Paper."

—The Diamond, Mid-Continent Petroleum Corp.

J. A. KENNEDY (Himself)

CHAMPION TIRE CHANGER OF THE WORLD!

THE MAN WHO Designed THESE TOOLS

Kennedy Tire Tools and Board

THESE 14 tools, designed by the holder of the world's record for speed in tire changing, are each necessary to insure speed and efficiency. They are sold separately or as a complete set.

All tools are cad-plated and are rust proof.

This set of tire changing tools has been endorsed by the major tire manufacturers.

KENNEDY TIRE TOOLS are made of chrome molybdenum steel and each one is properly designed for its particular job.

The tool board is of the easel type, the standard finish being olive green duco. Can be finished in any color. Combination colors slightly higher.

The Kennedy portable tire tool board will pay for itself in one week (perhaps in one day).

Mr. Kennedy using these tools exclusively, is still Champion Tire Changer of the world. *For literature and complete information write:*

THE KENNEDY COMPANY

St. Catharines, Ontario **Mogadore, Ohio**

AMERADA PETROLEUM CORPORATION

Producers of Crude Oil Manufacturers of Absorption Gasoline

120 BROADWAY, NEW YORK

TULSA, OKLAHOMA

New Refining Patents

Pressure Cracking. U. S. P. 1 894 355, Jan. 17, 1933, application filed July 30, 1926; Wilbur G. Laird, assignor to Heat Treating Co.

THIS invention relates to improvements in the treatment of residuum and reflux condensate in the pressure cracking of heavy oils. In prior practice there has been much difficulty in passing heated residuum through valves and pipes and releasing the pressure because the temperature is well above the flashing temperature when the pressure is released. Also, the practice of returning reflux condensate from the ordinary dephlegmator to the cracking chamber causes a loss of gasoline entrained in the condensate.

In the new method, the products withdrawn from dephlegmation for return to the cracking operation are first stripped of entrained gasoline, thus avoiding waste due to pressure release, and at the same time recovering this portion of the gasoline by not returning it to the heating zone. As a further feature, the topped reflux condensate and residuum are used to control the temperature in the condensing column, thus making the process still more efficient.

What is Claimed

Cracking oils by continuously advancing oil toward a cracking zone in heat exchange relation with but not in contact with vapors and gases from said zone, condensing higher boiling fractions of the vapors, topping the condensate to drive off occluded and absorbed light oils, and adding the topped condensate to the advancing oil while in said heat exchange with the vapors.

* * *

Utilizing Refinery Gases. U. S. P. 1 895 086, Jan. 24, 1933, application filed April 27, 1927; divided and this application filed Jan. 18, 1930; Frank Porter, assignor to Continental Oil Co.

THIS invention relates to a method and simple apparatus for the profitable utilization of refinery gases (containing butane, ethane or propane) by pyrolytic conversion into benzol and other valuable products. It is based on chemical reactions at high temperatures, long known but not hitherto successfully reduced to commercial practice with satisfactory yields at costs permitting profitable operation.

The pyrolysis is effected in a pair of furnaces, used alternately so that one is being heated while the other is in use for the reaction. An important feature in obtaining good yields is and so must be steadily made slower that the rate of gas flow must be adjusted according to the temperature. as the reaction temperature becomes lower. This control is automatically accomplished by means of an electrical instrument having a thermal conductivity cell. For further process control, it is important that the tubes of the furnace shall not exert an adverse catalytic influence; for this reason, iron or nickel tubes are unsuitable, but tubes made of or coated with chromium or tin are satisfactory.

What is Claimed

Apparatus for making benzol and by-products from hydrocarbon gases, comprising furnaces adapted to be alternately heated, inlets for passing hydrocarbon gases alternately thereto, heating means for the furnaces and means for cooling the gas after it leaves the furnace, a tar extractor for removing liquid from the effluent gas, a compressor connected to the tar extractor, and an accumulating and separating tank for removing benzol from the remaining gas.

* * *

Pipe Still Furnace. U. S. P. 1 894 215, Jan. 10, 1933, application filed Dec. 4, 1925; David G. Brandt, assignor to Foster-Wheeler Corp.

WHEN petroleum oils are heated in pipe stills having the tube bank at one side of the furnace, the usual practice of circulating the combustion gas downwardly through the tube bank has the disadvantage if inadequate temperature control, the tendency being toward overheating in the upper portion of the tube bank. When the tube bank is located at one side of a conventional bridge wall, the gas tends to flow down the side of the tube bank away from the bridge wall, so that the side next to the bridge wall is underheated.

In a novel system for temperature control to provide even heating of the tube bank, overheating of the upper tubes is avoided by partial cooling of the combustion gas and by shielding the upper tubes from the radiant heat from the furnace walls. The shielding means absorb heat both from the combustion gas and from the firebox, thus partially cooling both. The firebox temperature is further controlled by returning effluent combustion gas to the firebox, this being thermally more economical than the use of air for the same purpose. Underheating of the tubes next to the bridge wall is avoided by an improved construction which permits the bridge wall to absorb heat from the firebox and transmit it to the tubes.

What is Claimed

In a pipe still furnace, a tube bank at ane side of the firebox, a conduit below and along the tube bank, a passage from the middle of the conduit leading into a second passage, parallel to the conduit and opening into the firebox, means for feeding fuel into the firebox in a direction away from the table bank and toward the firebox opening of the second passage, means connected with the conduit for passing combustion gas from the furnace, and means in the first passage for returning to the firebox some of the combustion gas which has passed through the tube bank.

* * *

Pressure Cracking. U. S. P. 1 896 345, Feb. 7, 1933, application filed Oct. 20, 1926; John C. Black, assignor to Gasoline Products Co., Inc.

IN THE liquid phase pressure cracking of heavy oils there comes a stage in the cracking reaction when the increasing vapor pressure due to formation of lower boiling fractions generates a greater than the applied pressure, and vaporization occurs in the liquid system. Such vaporization is harmful to the efficiency of the process.

A method has now been developed for increasing the length of time during which a pressure cracking reaction may be maintained in the liquid phase, without vaporization, thus improving the efficiency of the operation. As one feature of the new method, the charging stock is topped to removed light fractions, which are refractory to cracking and increase the undesired vapor pressure during cracking, while at the same time lessening the thermal efficiency of the operation.

As another feature, the recycle stock comprising uncracked oil from the cracking chamber is also topped to remove entrained light fractions, before it is returned to the cracking chamber. Thus vapor pressure in the cracking chamber is kept lower than the applied pressure, thereby preventing vaporization, for a longer time than in prior practice.

What Is Claimed

Passing oil through a heating zone under sufficient pressure to maintain the liquid phase and at cracking temperatures, reducing the pressure and passing the hot cracked oil to a fractionating zone, vaporizing the gasoline and a higher boiling fraction, separating most of the gasoline fraction from the higher boiling distillate by fractionating and washing with a redistilled portion of the higher boiling distillate, thereby revaporizing, condensing and collecting most of the gasoline fraction from the wash oil, distilling retained gasoline and a portion of the higher boiling fraction from the wash oil and returning this distillate to the fractionating zone as a wash oil, removing the unvaporized fraction from the distilling zone and returning it to the heating zone for re-cracking together with fresh oil.

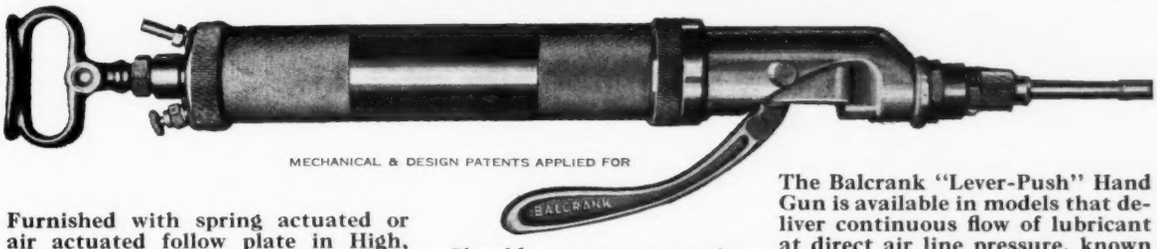
These Two Guns Will Modernize Your LUBRICATING SERVICE

The BALCRANK "Lever-Push"

ONE-MAN HAND GUN

THE most efficient, fastest and most economical hand lubricator ever developed. Not a Scissors nor a Push Type Hand Gun but a NEW "LEVER-PUSH" hand lubricator—a Balcrank exclusive feature. Shoulder pressure leaves one hand free.

It is far superior to the Scissors or Push Type Lubricator with none of their disadvantages. Lever operated does not tire the operator—Gun cannot wobble on bearing—Grease smashes through at high pressure with easy movement of lever on perfectly balanced barrel.



MECHANICAL & DESIGN PATENTS APPLIED FOR

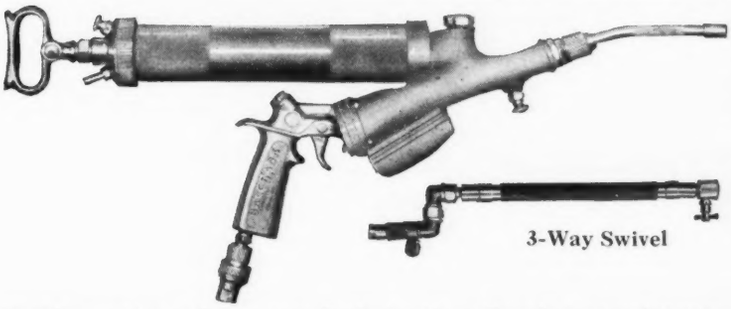
Furnished with spring actuated or air actuated follow plate in High, Medium or Low Pressure—interchangeable fittings satisfy every need.

Shoulder pressure permits easy one-man operation—One hand is Free—All fittings are easily reached.

The Balcrank "Lever-Push" Hand Gun is available in models that deliver continuous flow of lubricant at direct air line pressure, known as the Free Flow "Lever-Push" Gun.

The BALCRANK "CZA" Air Lubricator

ONE-MAN POWER GUN



3-Way Swivel

FOR perfect one-man air operation use the air primed, air operated Balcrank "CZA" Power Lubricator for Single Shot or Continuous flow of lubricant. Shoulder pressure holds gun firmly against fitting. One hand is free. Barrel is easily filled by bucket or suction and air primed in a jiffy with a Balcrank Kwikaire Coupler, standard equipment on each "CZA". For Alemite or Zerk Lubrication.

NO matter what your Lubrication Service requirement there is a Balcrank Lubricator that has been designed, engineered and developed for your need—efficiently, economically and built for your profitable operation. The Balcrank reputation for the quality of its products and the Service it renders is outstanding in the Industry. That is the reason Balcrank Service Station Equipment is preferred the country over.

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Better Lubricating Equipment

BALCRANK

THE CINCINNATI BALL CRANK CO., CINCINNATI, OHIO.

Wax Removal Methods

(*Continued from page* 39)

with a hole for the objective lens. The hot stage is connected to hot and cold water supplies with the thermometers showing the temperature of the water to the stage at inlet and outlet.

After distributing the oil droplet uniformly over the slide water is admitted to begin cooling the sample. Microscope and prisms are adjusted, and the oil is observed until the first crystals appear, and the temperature shown at that time is registered as the "saturation temperature" of the distillate. Hot water through the stage raises the temperature of the oil then to a point 40° F. above this saturation temperature, and cold water is admitted at such rate that the sample is cooled at the rate of 1.7 F. degrees per minute until the sample cooled to a temperaure 10 F. below that of saturation first recorded. The microscope is then accurately focused, and the photographic plate exposed. In routine work where the distillate characteristics are known this preliminary cooling may be dispensed with, since the saturation temperature can be accurately estimated.

By this method the properties of crystal structure of a distillate can be reported to the operating department within an hour of the receipt of the sample.

The influence of width of distilling range, conditions of distillation, and all other influencing factors in producing wax distillate may be studied in this manner. A distillate may be closely fractionated in the laboratory at low pressures, and each resulting sub-fraction may be studied and photographed and the crystal structure of the various portions accurately determined.

"The actual control procedure used at Ponca City," the authors observed, "is to examine a sample of pressing stock from each finished run tank, and from the still streams each morning, for crystal structure. The quality of the crystal form is reported to the operating department by number. No. 1 represents a very good large-plate structure, No. 10 a very poor product. In unusual cases . . . . photomicrographs are made and prints sent to both the distillation and wax-plant departments."

Shell Gets Air Contracts

ST. LOUIS—U. S. Army and Navy gasoline contracts for the second quarter of the year have been awarded the Shell Petroleum Corp. These call for 1,392,000 gallons, according to L. van Eeghen, vice-president in charge of sales.

The Army contract is for 392,000 gallons for the Quartermaster Depot at Chicago. The Navy contract calls for 1,000,000 gallons, half of which is to be the new Super Shell grade recently placed on the market without a 3 cent premium.

Major James H. Doolittle, head of the company's aviation department, recently obtained a contract from American Airways, Inc., for 2,600,000 gallons of aviation gasoline to be delivered this year.

Vacuum Oil Buys Out Akron Jobber

CLEVELAND, May 15.—Vacuum Oil Co., Inc., a Socony-Vacuum Corp. subsidiary, has bought the Brite Star Oil Co. of Akron, O., which has 10 service stations, one bulk plant and a dealer outlet system. Brite Star had been a Vacuum distributor in Akron for almost two years.

Charles Maier and H. J. Burnett, who were partners in Brite Star, have been retained by Vacuum which also will be represented in the management of the Akron business by C. E. Miller.

Crowe and Masel Form Engineering Firm

TULSA, May 11.—The Koalt Engineering Co., recently organized by M. B. Crowe and Max J. Masel, has established headquarters in the Mayo Bldg., Tulsa, as manufacturers' consultants for the southwestern territory. This company is engineering and sales representatives for Key Boiler and Equipment Co., Timken Steel and Tube Co., Century Castings Co., and Wyman Gordon Co.

Both Mr. Crowe and Mr. Masel are well known to the refining trade in the Mid-Continent. Mr. Crowe formerly had headquarters at Tulsa before going to main offices of Key Boiler at St. Louis. Mr. Masel has been representing Key in this territory for the past two years.

The company will handle return bends, fittings, etc., for the Key company, Timken heavy duty heat resistant tubes, Century castings, and similar equipment, and alloy steel products manufactured by the Wyman Gordon Co.

"Ed Wynn" on Fire Truck

CLEVELAND—The White Motor Co. has equipped a fire engine pumper with dummy figures of Ed Wynn, The Texas Co. radio fire chief, and firemen to exhibit at the Travel and Transportation exhibit at Chicago's Century of Progress this summer. The truck was driven over Cleveland streets this week, and will be driven in other cities on its way to Chicago. The exhibit will be in action with the truck wheels turning and fans blowing the firemen's coats.

State Claims Inferior Gasoline is Sold

HOUSTON, May 11.—Tests of motor fuel refined and distributed in East Texas have been found by representatives of the state's tax agency to be inferior in quality, according to C. A. Paxton, assistant supervisor in enforcement work. Tests made by E. G. Lenay, state chemist, show inferior products in 59 out of 144 instances.

Out of 55 refinery tests made products were found inferior in 12 instances; on tests made of 23 truck samples 15 were inferior; and of 66 tests on filling station samples 32 were described as inferior.

Paxton announced his "last warning," saying the handling of inferior motor fuel in East Texas had grown into a "large racket." He said handlers of gasoline had been "given ample time to become acquainted with the new law and now we intended to prefer charges in every case we find."

Under the recently passed law the blending of kerosine and gasoline in Texas is a felony; and the penalty for selling inferior motor fuel without it being so labeled is a fine of $25 to $200 and imprisonment of one month to one year.

Stations Get Garden Club Aid

CLEVELAND, May 12.—A statewide garden contest for service stations has been announced this spring by the Standard Oil Co. of Ohio, with cash prizes going to salesman at stations which are judged to have the most attractive landscaping with flowers, shrubs and lawns. The condition of the station building and equipment will also be considered.

In this year's contest the Standard has obtained the co-operation of officials of Ohio's leading garden clubs, according to A. A. Stambaugh, general sales manager. Endorsement of the beautification plan have been received from women presidents of various Ohio garden clubs.

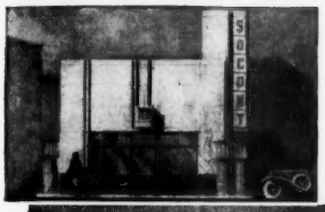
Garden clubs will give advice on proper selections of flowers and planting of gardens.

Gasoline Demand Down 15% in Canada

OTTAWA, Canada.—Gasoline consumption in Canada during February totaled 22,677,000 gallons, a drop of 4,196,000 gallons, or 15.16 per cent under February a year ago, and a decrease of 5,035,000 gallons under January, this year.

Production of crude in March totaled 87,218 barrels, compared with 73,087 barrels the preceding month, and 97,484 barrels in March a year ago according to the Dominion Bureau of Statistics.

TRUSCON AUTO-SERVITORIUMS



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In dealing with Truscon, you receive a most complete service. We manufacture every product which enters into service stations,—structural steel frame, steel windows, steel doors, steel roof, wall panels, racks, counters, partitions,—in other words, we produce the entire building from foundation to roof quickly and at a low cost.

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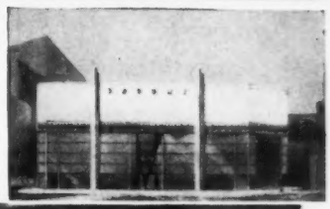

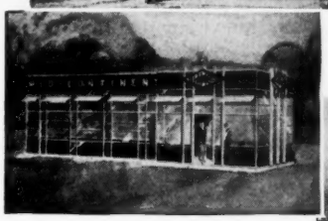

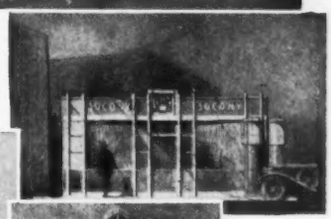

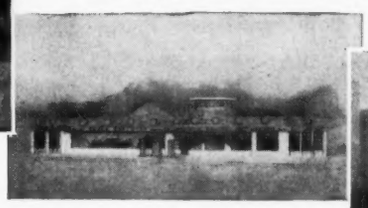

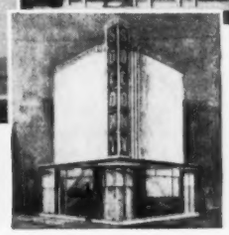

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See Pages
57 to 60

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NATIONAL PETROLEUM NEWS
1213 West 3rd St. Cleveland, Ohio

NEW PATENTS

Prepared by R. E. Burnham, patent and trade-mark attorney, 1343 H Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

April 11, 1933

REFINING

Art of cracking and distilling fuels—Russell Carter, Washington, D. C. Filed Feb. 13, 1926. No. 1,903,749.

PRODUCTION

Protector for drill-pipe and the like—John W. MacClatchie, Compton, Calif. Filed May 27, 1929. No. 1,903,467.

Instrument for recording inclination—William I. McLaughlin, Piedmont, and Rupert G. Wedemeyer, Palo Alto, Calif.; said Wedemeyer assignor to Standard Oil Co. (Calif.) Filed Nov. 3, 1930. No. 1,903,512.

MISCELLANEOUS

Synthetic rubber and process of manufacture (from polymerizable hydrocarbons)—Frederick B. Downing, Careys Point, and Donald H. Powers, Penns Grove, N. J., assignors of E. I. du Pont de Nemours & Co. Filed Aug. 12, 1927. No. 1,903,500.

Hydrogenation of hydrocarbons—William S. Calcott, Penns Grove, N. J., and Albert S. Carter, Wilmington, Del., assignors to E. I. du Pont de Nemours & Co. Filed Mar. 24, 1930. No. 1,903,501.

Motor Fuel—Roy T. Hurley, Dobbs Ferry, N. Y., assignor to Motor Meter Gauge & Equipment Corp., Long Island City, N. Y. Filed July 16, 1928. No. 1,903,624.

April 18, 1933

REFINING

Apparatus for refining oil—Chauncey B. Forward, Urbana, Ohio, assignor to Forward Process Co. Filed Oct. 13, 1919. No. 1,903,810.

Process and apparatus for manufacture of sweated paraffin from non-sweated paraffin and like substances—Reiner Meijer, The Hague, Netherlands. Filed July 29, 1930. No. 1,903,929.

Process for treating hydrocarbons—Edwin J. Gohr, Elizabeth, N. J., assignor to Standard-I. G. Co. Filed Feb. 2, 1931. No. 1,904,133.

Process for treating low-boiling hydrocarbons—Heliodor Rostain, Berlin, Germany. Filed Mar. 2, 1929. No. 1,904,172.

Treatment of hydrocarbon oils—Edwin R. Berkhimer, Philadelphia, Pa., assignor to Atlantic Refining Co. Filed May 15, 1931. No. 1,904,402.

Conversion of solid fuels and products derived therefrom or other materials into valuable liquids—Carl Krauch, Ludwigshafen-on-the-Rhine, and Mathias Pier, Heidelberg, Germany, assignors to Standard-I. G. Co. Filed Feb. 6, 1926. No. 1,904,476.

Production of valuable organic products—Krauch & Pier, and Eugen Anthes, assignors to I. G. Farbenindustrie. Filed Jan. 5, 1928. No. 1,904,471.

Separation of oils from solid residues—Mathias Pier and Karl Winkler, assignors to Standard-I. G. Co. Filed Sept. 15, 1928. No. 1,904,521.

Method for recovering valuable materials from spent catalysts—Rhea N. Watts, Baton Rouge, La., assignor to Standard-I. G. Co. Filed Apr. 11, 1931.

Conversion of carbonaceous solids into valuable liquid products—Karl Winkler and Kurt Wissel, assignors to I. G. Farbenindustrie. Filed Dec. 15, 1927. No. 1,904,586.

Process for decolorizing oils—Ira K. Fuller, Olean, N. Y., assignor to Contact Filtration Co. Filed Sept. 28, 1929. No. 1,904,682.

* * *

The following to Universal Oil Products Co., as assignee of the inventors:

Conversion of hydrocarbon gases—Gustav Egloff, Chicago, Ill. Filed Apr. 8, 1931. No. 1,904,362.

Apparatus for vapor fractionation—Jacque C. Morrell and Joseph G. Alther, Chicago. Filed Apr. 25, 1927. No. 1,904,380.

Refining of hydrocarbon oils—Morrell. Filed Nov. 11, 1929. No. 1,904,381.

Process for sweetening hydrocarbon distillates containing mercaptans—Morrell. Filed Nov. 15, 1929. No. 1,904,382.

* * *

The following to Standard Oil Development Co., as assignee of the inventors:

Apparatus for fractionating liquids—Paul E. Kuhl, Elizabeth, N. J. Filed Jan. 25, 1930. No. 1,904,144.

Method of removing corrosive sulphur from hydrocarbon oils. Reginald K. Stratford and William P. Doohan, Sarnia, Ont., Canada. Filed May 21, 1928. No. 1,904,173.

Process of treating oils—Alfred A. Wells, Roselle Park, N. J. Filed Nov. 22, 1929. No. 1,904,183.

Apparatus for treating hydrocarbons—Seward R. Bolles, Elizabeth, N. J. Filed Jan. 18, 1928. No. 1,904,196.

Method and apparatus for distilling oil—Charles R. Ewing, Toronto, and Thomas Montgomery, Sarnia, Canada. Filed Jan. 3, 1929. No. 1,904,213.

Process for removal of hydrogen sulphide from gas mixtures and for recovery of elemental sulphur—William J. Edmonds and Oliver H. Dawson, Baytown, Tex. Filed Jan. 21, 1930. No. 1,904,424.

Process for restoring activity of hydrogenation catalysts — James A. Franceway, Baton Rouge, La. Filed June 23, 1930. No. 1,904,218.

Hydrocarbon oil and method of making—Herbert G. M. Fischer, Westfield, and Clifford E. Gustafson, Elizabeth, N. J. Filed Sept. 21, 1928. No. 1,904,433.

Production of hydrogen from hydrocarbon gases. George H. Freyermuth, Elizabeth, N. J. Filed Mar. 5, 1930. No. 1,904,439.

Reactivation of catalyst used in preparation of hydrogen—George H. Freyermuth, and William V. Hanks of Baton Rouge, La. Filed Mar. 6, 1930. No. 1,904,440.

Process for production of hydrogen from refinery and other hydrocarbon gases—Freyermuth, James K. Small, and Hanks. Filed Mar. 7, 1930. No. 1,904,441.

Process for manufacture of hydrogen—Philip L. Young, New York, N. Y., and Hanks and Freyermuth. Filed Aug. 30, 1929. No. 1,904,592.

Process for manufacture of gas rich in free hydrogen—Young and Hanks. Filed Aug. 31, 1929. No. 1,904,593.

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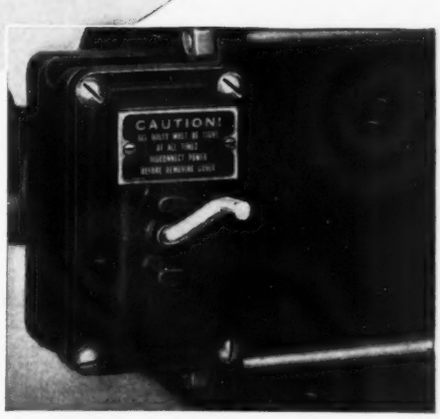

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210-214

GENERAL ELECTRIC

OIL STOCKS AND FINANCES

Shell Union Reports $660,076 Profit, $4,288,496 Operating Loss

CLEVELAND, May 11

SHELL UNION OIL CORP. and subsidiaries report net profit of $660,076.34 for 1932 after crediting to income the difference between par value of debentures bought and retired, and the purchase price. This addition amounted to $4,948,572.39, leaving loss from operations of $4,288,496.05 after costs, expenses, interest and reserves for depletion, depreciation, abandonments and intangible development expenses. These reserves amounted to $31,665,072.23.

In 1931 Shell Union had a net loss of $27,008,310.21.

The Dec. 31, 1932, balance sheet shows total assets and liabilities of $650,025,779.26. After deduction of $244,231,035.55, depletion, depreciation and intangible development reserves and $12,840,176.47 profit and loss deficit the net assets amounted to $392,854,567.24.

After providing for income and franchise taxes, settlement of litigation and for other contingencies affecting prior years the profit and loss deficit was increased $339,066.91 last year.

Current assets Dec. 31, 1932, amounted to $80,193,903.11, including $12,600,000 short term deposits, $3,030,312.50 U. S. treasury obligations, and $10,925,824.97 cash. Current liabilities were $20,542,697.58, a current ratio slightly under 4 to 1.

Crude and refined oils were carried at the lower of cost or market at $33,511,835.60.

The quick cash assets, totaled $26,556,137.47, compared with $36,850,913.96 at the end of 1931. Cash was used last year to buy and retire debentures having a principal value of $26,299,000 and to pay purchase obligations maturing in future years, J. C. Van Eck, president, announced.

Shell Union's write-offs last year totaled $31,665,072.23, compared with $45,244,100.88 in 1931. A decision was reached to use for 1932 and subsequent years the maximum depreciation rates tentatively agreed upon with the Treasury Department for income tax purposes instead of the rates formerly used by Shell Union, but only so far as such agreed rates were thought by the company to be fully adequate.

"Insofar," the company's report states, "as such rates are considered inadequate, or insofar as no rates are fixed, your companies are setting up such reserves, or such rates, as are considered adequate, to provide, during their life, sufficient capital for the replacement of the physical assets.

Of the $13,679,000 decrease in total write-offs from 1931 more than $6,100,000 was due to the fact that the charge for surrendered leases and abandoned wells in 1932 was only about one-fourth of that for 1931 when a large number of doubtful leases were surrendered. About $4,700,000 of the reduction in write-offs was due to the adoption of the new rates.

As pointed out in the report, many of Shell Union's properties have been fully depreciated and strict limitations have been placed upon new investments in recent years so that the depreciation write-offs for 1932 would have been materially less than those for 1931 even had former depreciation rates been continued in use.

Mr. Van Eck pleaded for continuation of efforts to bring about a general application of proration. He urged that the full authority granted by existing conservation laws should be exercised and all orders issued under such laws by regulatory agencies should be rigidly enforced. "Until proration is made fully effective," he said, "it cannot be fairly said to have had a proper chance of proving its benefit to the oil industry."

Property taxes, franchise taxes, etc., paid by Shell Union and its subsidiaries, amounted to $4,506,663.02, while gasoline taxes were $36,888,382.53. Pointing out that early taxation of motor vehicles and gasoline was influenced by the thought that automobiles were luxuries and should be taxed more heavily than older forms of transport, Mr. Van Eck said. "Something of this old idea remains, and there is a constant tendency by all legislative bodies to increase taxes on gasoline and motor equipment far beyond any justification. It is becoming increasingly apparent that the petroleum industry cannot hope to prosper until gasoline taxes are lightened."

He also pointed out that the tendency to impede the development of motor transportation by regulation would only handicap the growth of the motor industry and not benefit any other transportation agency.

Crude oil production of Shell Union subsidiaries last year was 35,598,464 barrels gross and 30,999,244 barrels net. In 1931 its gross production was 35,766,325 barrels and net production 31,057,764 barrels.

Intake at refineries totaled 59,525,010 barrels of crude last year as against 62,072,243 barrels the year before.

Consolidated Income Accounts of Shell Union Oil Corp. and Subsidiaries

	1932	1931
Gross operating earnings	$161,124,752.56	$177,582,782.50
Operating and general expenses	128,415,204.42	152,850,337.00
Operating income	$32,709,548.14	$24,732,445.50
Depletion, depreciation, intangible development expenses, etc.	31,665,072.23	45,344,100.88
Minority interest in earnings	43,081.32	1,451.93
Interest, amortization of debenture discount	5,289,890.64	6,395,202.90
Loss from operations	$4,288,465.05	$27,008,310.21
Excess of par value of debentures over cost of debentures bought during year	4,948,572.39	.....
Profit for year	$660,076.34	*$27,008,310.21

*Loss.

Phillips Reports Small Rise in Quarter Loss

TULSA, May 11.—Phillips Petroleum Co. had a net loss of $2,179,621 the first quarter of 1933, compared with net loss of $2,136,922 the first quarter of last year. These sums are after charges for all expenses, taxes and interest and reserves. Depletion, depreciation and other reserves were $3,607,835 the first quarter this year, compared with $5,231,992 the first quarter last year.

Frank Phillips, president, told stockholders at the annual meeting at Bartlesville that the company's volume of business the first quarter this year was the largest in any first quarter in the history of the company. He said the oil industry was in position to get profitable prices providing the movement to curtail crude oil production to market demand proves successful and gasoline tax evasion is eliminated.

Pan American Foreign Nets $1,998,359

NEW YORK, May 6.—Pan American Foreign Corp. and subsidiaries report net profit of $1,998,359 after all charges and reserves in the eight months ended Dec. 31, 1932. This corporation was formed to take over the foreign properties of Pan American Petroleum & Transport Co. It is controlled by Standard Oil Co. (N. J.)

The company had outstanding at the end of 1932 3,416,082 $1 par class A and B common shares. Its total assets were carried at $172,299,087. Current assets Dec. 31 were $32,372,064, including $5,261,892 cash and $33,692 marketable securities. Current liabilities were $8,030,383.

Simms Reports First Quarter Loss

CLEVELAND, May 8.—Simms Petroleum Co. reports net loss of $238,891 for the first quarter of 1933 after expenses, taxes, drilling costs, depletion, depreciation and abandonments, compared with net loss of $226,899 in the first quarter of 1932.

Simms' net crude production the first quarter this year was 748,479 barrels, compared with 751,590 barrels the corresponding time last year. Net current assets March 31, 1933, were $1,805,629, or $3.66 a share on the 494,000 shares of stock then outstanding. Since March 31 the company has bought 33,900 shares of its stock, Edward T. Moore, president, reported.

Warner-Quinlan Reports $2,366,563 Loss

NEW YORK, May 15.—Warner-Quinlan Co. and subsidiaries report net loss of $2,366,563 for 1932, compared with net loss of $711,524 in 1931. The 1932 loss includes $256,305 patent development costs and losses in retirement of properties. The 1932 report includes the results of operation of the Municipal Service Corp., whose accounts were not previously consolidated.

"A large portion of its business is conducted through service stations in the metropolitan area of New York and in communities closely adjacent thereto," said W. W. McFarland, president, in explaining the results of 1932 operations. "As a result of the substantial falling off of demand and extremely unsatisfactory price structure, the company suffered a substantial loss in this department of its business. These conditions are largely due to the depression, which has persisted since 1929. However, in view of the constructive program sponsored by our national government, and indications that business conditions have at last shown signs of an upward tendency, it is hoped that the company's affairs will be substantially benefited and reflected in better earnings."

The company's consolidated balance sheet of Dec. 31, 1932, shows current assets totaling $4,623,474, including $717,110 cash, and current liabilities totaling $5,917,651. Total assets after deduction of depletion and depreciation reserves, were carried at $31,281,016 at the end of last year. Its funded debt amounted to $6,372,000.

New McColl Director Chosen

MONTREAL—W. G. Mitchell has been elected a director of McColl Frontenac Oil Co. to fill a vacancy on the board. John Irwin, president, announced at the annual meeting that an increase in the company's dividend rate was unlikely because the company would be able at this time to take care of expenditures for new equipment by conserving its strong liquid position.

Final Dividends Declared

NEW YORK, May 13.—Final dividends have been declared by the Royal Dutch Co., Shell Transport & Trading Co., and Burmah Oil Co. Royal Dutch is paying 6 per cent for 1932, the same as in 1931. Shell's rate is unchanged at 7½ per cent. Burmah has declared 15 per cent, as against 20 per cent in 1931.

Ohio Oil Reports Loss

CLEVELAND, May 15.—Ohio Oil Co. had a net loss of $1,418,245 the first quarter of 1933, compared with net profit of $1,656,106. These sums are after expenses, taxes and reserves, but before dividends on the preferred stock. Ohio's current assets March 31, 1933, amounted to $29,377,210, including $1,360,860 cash, and current liabilities to $2,734,180.

New York Bonds

Week Ending May 13

	High	Low	Last	Change
Asso. Oil Gold 6s	103	102⅜	102⅜	0
Atlantic Refg. deb. 5s	101½	99¾	101	+1½
Cal. Pet. 5s	84½	82½	82½	—1
Cal. Pet. 5½s	90	86	88¼	+3¼
General Pet. 5s	102½	101¾	102½	0
Humble Oil & Refg. 5s	102½	101¾	102¼	+5
Pan Amer. Pet. of Calif. 6s	36	35	36	+2¼
Phillips Pet. 5½s	81½	78	81½	+3½
Pure Oil 5½s	81	78½	81	+2
Pure Oil 5½s	76¾	71⅜	76¼	+4¼
Richfield Oil of Calif. 6s	28	26	28	+ ¾
Richfield Oil of Calif. 6s ctfs	27	25½	26⅛	+ ⅛
Shell Union Oil 5s	81	74	77½	+2½
Shell Union Oil 5s w.w.	80	73⅞	79¼	+5
Sinclair Con. Oil 7s	98	96¾	98	+ ½
Sinlair Con. Oil 6½s	94½	93⅞	94½	+ ¼
Sinclair Pipeline	103	101	103	+2
Skelly Oil 5½s	76½	71¾	76½	+5
S. O. N. J. 5s	104¼	102½	104¼	+2⅜
S. O. N. Y. 4½s	96½	93¾	96½	+3¼
Union Oil of Calif. 6s A	102½	102	102½	+1¾
Union Oil of Calif. 5s C	100⅜	99¾	99¾	0
Union Oil of Calif. 5s w.w.	86½	83	86½	+2½
Warner-Quinlan 6s	23	21	22½	+2½

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Transactions in Oil Stocks on New York Stock Exchange

1932 High	1932 Low	1933 High	1933 Low	Listed Shares	Par Value	Company	Div. Rate Period	Last Div. Paid	Transactions Week Ended May 13 Sales Shares	High	Low	Last	Week's Change
22¾	12	38	18½	922,070	N.P.	Amerada Corp.	50cQ	Apr. 29, 33	36,700	*38½	31¼	34¾	+ 2¼
16½	6½	16	6¾	2,240,000	$25	Associated Oil Co.	25cQ	Mar. 31, 33	190	15	11	15	+ 3½
21⅞	8⅝	21	12⅝	2,696,652	25	Atlantic Refining Co.	25cQ	Mar. 15, 33	105,600	*21	18	20½	+ 2
7	3⅝	6½	3	2,258,779	5	Barnsdall Corp.	....	May 11, 31	79,000	*6½	5¼	6⅜	+ 5/8
12½	9	12	10	1,444,970	N.P.	Colonial Beacon Oil Co.	....	.....	100	5¼	5¼	5¼	— 5
9	4	9¼	5	14,218,835	N.P.	Consolidated Oil Corp.	....	.....	172,100	*9¼	7⅝	8⅛	+ ¾
101	79	100¼	95½	136,012	$100	do pfd.	$2Q	Feb. 15, 33	100	98⅛	98⅛	98⅛	+ 1⅛
9⅝	3⅝	12⅜	4⅞	4,722,432	N.P.	Continental Oil Co.	....	.....	229,700	*12⅜	10	12	+ 1⅞
15½	4⅜	12⅜	4⅝	413,333	N.P.	General Asphalt Co.	....	June 15, 32	18,600	*12¾	10	12⅛	+ 1⅛
28¼	8¾	22⅜	8¼	95,841	$100	Houston Oil Co.	....	.....	20,100	*22⅜	18½	21	+ 1⅝
5⅜	1⅝	4½	1⅞	678,234	25	do new	....	.....	12,100	4½	3⅞	4¼	+ ¼
2⅝	1	2¼	1⅛	1,207,082	10	Indian Refining Co.	....	Dec. 15, 20	1,900	*2¼	1¾	2¼	+ ¼
2¼	½	2	⅝	1,309,060	N.P.	Louisiana Oil Ref'g. Corp.	....	.....	2,500	2	1⅝	1⅞	+ 3/8
18	3	7	3½	40,000	$100	do pfd.	....	May 16, 32	.....	....	....	....	....
1½	⅜	1⅝	½	330,000	N.P.	Maracaibo Oil Exploration Co.	....	.....	900	1¼	⅞	1¼	+ ⅜
65	50	55	55	449,083	$100	Mexican Petroleum Co.	....	Apr. 20, 31	.....	....	....	....	....
8⅞	3¾	9¼	3¾	1,857,912	N.P.	Mid-Continent Petroleum Corp.	....	Feb. 16, 31	44,200	*9¼	7¾	9	+ ¾
11	5	10½	4¾	6,548,052	N.P.	Ohio Oil Co.	....	Dec. 15, 32	130,700	*10½	8¾	10⅛	+ 1
14	6	12½	12	1,000,000	$5	Pan American Pet. & Transp. Co.	....	Mar. 15, 33	.....	....	....	....	....
14½	7¼	12½	11½	2,474,886	5	do B non-voting	....	Mar. 15, 33	.....	....	....	....	....
1¼	¼	1¾	⅝	199,370	N.P.	Panhandle Prod. & Ref'g. Co.	....	.....	9,700	*1¾	⅞	1½	+ ½
14	3½	7	5¾	25,666	$100	do pfd.	....	July 2, 23	10	6	6	6	— 1
7⅛	3	9	4⅝	2,236,944	5	Petroleum Corp. of America	....	June 1, 31	13,200	*9	7¾	8⅛	+ ⅞
8⅛	2	11¼	4¾	4,433,801	N.P.	Phillips Petroleum Co.	....	Jan. 2, 31	130,000	*11¼	9¼	11	+ 1¼
¾	¼	⅝	¼	1,184,817	$25	Pierce Oil Corp.	....	.....	14,300	¾	½	¾	+ ⅛
9	3½	8¾	3⅞	150,000	100	do pfd.	....	Feb. 1, 22	1,500	*8¾	7	8¼	+ ¾
1⅝	½	1¼	⅝	2,500,000	N.P.	Pierce Petroleum Corp.	....	Feb. 16, 31	14,100	*1¼	1	1¼	+ ⅛
12⅞	8½	9½	6¾	1,050,000	$5	Plymouth Oil	25cQ	Mar. 31, 33	9,200	9⅛	8¼	8½	— ⅛
9½	3½	8⅞	5⅝	2,441,432	25	Prairie Oil & Gas Co.	....	Mar. 31, 31	600	*8⅞	8⅝	8⅞	+ 3¼
12¼	5½	13	7	4,050,000	25	Prairie Pipe Line Co.	....	July 1, 31	1,300	*13	11¼	13	+ 3½
1⅝	⅛	1⅜	¼	749,017	50	Producers & Refiners Corp.	....	Sept.15, 23	15,800	*1⅜	¾	1¼	+ ⅜
9¾	1	8	3	28,310	50	do pfd.	....	May 4, 25	420	*8	6	8	+ 1½
6½	2⅞	5⅞	2½	2,038,370	N.P.	Pure Oil Co.	....	Sept. 1, 30	70,500	7	5⅜	6¾	+ 1⅛
80	50	62	30	180,000	$100	do 8% pfd.	50cQ	Apr. 1, 33	420	49	43	49	+ 5
1⅜	¼	⅝	¼	2,126,250	N.P.	Richfield Oil Co. (California)	....	Sept. 1, 30	4,100	⅝	½	⅝	+ ⅛
23⅜	12⅛	26¼	17⅝	433,814	$13.40	Royal Dutch Co. (N. Y. shares)	80⅓c	Aug. 5, 32	3,800	25⅜	23½	24½	— 1⅝
20⅜	6⅞	29⅞	15	1,244,383	N.P.	Seaboard Oil Co. of Del.	††10cQ	Mar. 15, 33	27,800	*29⅞	25½	28	+ 1½
16⅜	8	18	11¼	57,192	L2	Shell Transport & Trading Co.	53c	July 22, 32	.....	....	....	....	....
8¾	2½	7⅜	4	13,070,625	N.P.	Shell Union Oil Corp.	....	June 30, 30	47,000	7¼	6	7	— ⅜
65¼	18	46¼	28½	400,000	$100	do pfd.	....	July 1, 31	1,700	*46¼	42	46	+ 3½
7½	3¼	9¼	4⅞	500,000	10	Simms Petroleum Co.	25cQ	Jan. 16, 33	12,200	*9¼	7½	9	+ 1½
5¾	2½	5⅞	3	1,000,000	25	Skelly Oil Co.	....	Dec. 15, 30	6,200	*5⅞	4¾	5¾	+ 3/8
33½	12	33	22	120,000	100	do pfd.	....	May 1, 31	900	33	31½	33	0
12¼	5¼	11	6	31,693,086	25	Socony Vacuum Corp.	10cQ	Mar. 15, 33	195,400	10⅜	9¼	10	+ ½
100½	81	101	92½	764,925	100	S. O. Export Corp. pfd.	$2.50S.A.	Dec. 31, 32	1,000	98	96½	98	+ 2
31⅞	15⅛	31⅞	19½	13,102,900	N.P.	S. O. California	50cQ	Mar. 15, 33	95,400	31¾	28⅞	31¼	+ 1⅝
16½	7	17⅝	12¾	320,000	$10	S. O. Kansas	....	Mar. 16, 31	1,500	17	16	17	+ 5/8
37⅜	19⅞	35⅝	22¾	25,740,965	25	S. O. New Jersey	25cQ	Mar. 15, 33	141,600	*35⅝	33	35	+ ¾
39⅞	24¾	38¾	35	1,590,406	N.P.	Sun Oil Co.	25cQ	Mar. 15, 33	700	38⅞	37	38¾	0
92	68	98	89	100,000	$100	do pfd.	$1.50Q	Mar. 1, 33	110	94½	93½	94½	+ 2⅞
2	¼	2¾	¾	776,979	N.P.	Superior Oil Corp.	....	.....	75,100	*2¾	1⅜	2½	+ 1
18¼	9¼	17¾	10¾	9,851,236	$25	The Texas Corp.	25cQ	Apr. 1, 33	79,900	*17¾	16	17½	+ ⅜
4	1½	2⅞	1⅝	930,507	10	Texas Pacific Coal & Oil Co.	....	Dec. 31, 29	8,500	*2⅞	2½	2¾	+ 1/8
5⅝	2	5½	3⅛	5,998,919	N.P.	Tide Water Associated Oil Co.	....	Feb. 16, 31	27,900	*5½	4⅝	5¼	+ ¼
60	20	44⅛	23½	695,503	$100	do pfd.	....	Jan. 3, 33	900	37	34¼	36½	+ ½
10	5	12	9¼	2,191,954	N.P.	Tide Water Oil Co.	....	Dec. 31, 32	200	*12	11¾	12	+ 2¾
62	30	60	45	199,446	$100	do pfd.	$1.25Q	Feb. 15, 33	300	*56½	56	56½	+ 1
15⅝	8	14	8½	4,386,070	25	Union Oil Co. California	25cQ	May 10, 33	22,800	13¾	12⅛	13½	+ ¼
19¼	11¾	17⅜	10½	1,254,048	N.P.	Union Tank Car Co.	35cQ	Mar. 1, 33	1,800	*17⅜	16	17⅜	+ ⅞
2¼	½	1½	⅝	769,531	N.P.	Warner Quinlan Co.	....	July 3, 30	3,900	1⅝	1¼	1½	+ 3/8
8¼	2¾	4⅛	2	431,427	N.P.	H. F. Wilcox Oil & Gas Co.	....	May 10, 28	7,600	4⅜	3⅝	4¼	+ ¼

*New high. †New low. ††Also extra—Seaboard 10c.

Standard Oil Stocks on New York Curb Market

1932 High	1932 Low	1933 High	1933 Low	Shares Issued	Par Value	Company	Div. Rate Period	Last Div. Paid	Transactions Week Ended May 13 Sales Shares	High	Low	Last	Week's Change
7	6	7	6	40,000	$25	Borne Scrymser Co.	....	Oct. 15, 30	200	7	6½	7	+ 1
35	17½	30	25	200,000	50	Buckeye Pipe Line Co.	75cQ	Mar. 15, 33	.....	....	....	....	....
90	53	95	71	120,000	25	Chesebrough Mfg. Co.	††$1Q	Mar 31, 33	350	*95	92	93½	— 1½
3⅛	1¾	6¼	2¼	5,977,873	N.P.	Creole Petroleum Co.	....	.....	11,500	5⅞	5⅛	5⅞	+ 3/8
35	18	28½	20	50,000	$100	Eureka Pipe Line Co.	$1Q	May 1, 33	.....	....	....	....	....
55	35⅝	59⅞	40	2,974,645	25	Humble Oil & Refg. Co.	50cQ	Apr. 1, 33	15,400	*59⅞	55¼	59¼	+ 2¼
10⅞	6¼	10⅛	6½	26,742,792	N.P.	Imperial Oil Corp. coup.	12½cQ	Mar. 1, 33	7,700	*10⅛	9⅜	10⅛	0
10⅛	6½	9⅞	6½	.....	N.P.	do registered	12½cQ	Mar. 1, 33	1,100	9⅞	9½	9½	— ⅜
7½	2¾	5⅛	3⅛	300,000	$10	Indiana Pipe Line Co.	††10c S.A.	Nov. 15, 32	400	*5⅛	4⅝	5⅛	+ ½
12¼	8	13¾	8⅞	14,247,088	N.P.	International Petroleum Co.	25cQ	Mar. 15, 33	18,800	13¾	12½	13⅜	+ 7/8
10½	6	8	5½	509,000	$12.50	National Transit Co.	....	Dec. 15, 32	700	*8	7	8	+ 1⅛
6	2¼	3¾	3	100,000	5	New York Transit Co.	15c S.A.	Apr. 15, 33	100	3	3	3	0
5½	3⅛	5⅞	4¼	120,000	10	Northern Pipe Line Co.	25cS.A.	Jan. 2, 33	.....	....	....	....	....
79	60	76	70¼	580,749	100	Ohio Oil Co. pfd.	$1.50Q	Mar. 15, 33	100	75	75	75	+ 1
10	1¾	2	1¼	400,000	25	Penn Mex. Fuel Co.	....	May 25, 32	.....	....	....	....	....
10	3¾	4	2¾	100,000	10	Southern Pipe Line Co.	10cQ	Mar. 1, 33	700	*4	3	4	+ ½
16½	9⅝	16	11	1,200,000	25	South Penn Oil Co.	25cQ	Mar. 31, 33	1,500	*16	14½	15¾	+ ¼
37	27	33	24½	35,000	50	South West Pa. Pipe Lines	$1Q	Apr. 1, 33	.....	....	....	....	....
25⅛	13⅛	26¼	17	16,908,543	25	S. O. Indiana	25cQ	Mar 15, 33	36,700	*26¼	24½	26	+ 1¼
15⅞	8⅞	14⅜	8⅝	2,606,983	10	S. O. Kentucky	25cQ	Mar. 31, 33	3,100	*14⅜	12¾	14⅜	+ 7/8
19	10¼	13½	11	190,822	25	S. O. Nebraska	25cQ	Mar. 20, 33	400	13½	13¼	13¼	0
30⅛	15½	21	15½	752,465	25	S. O. Ohio	....	Jan. 3, 33	1,350	19	17½	18½	+ 1
87	75	85	60	120,000	100	do 5% pfd.	$1.25Q	Apr. 15, 33	20	70	70	70	+10
2	1⅝	1½	1	34,158	25	Swan Finch Oil Corp.	....	Jan. 15, 32	100	1½	1½	1½	0

*New high. †New low. ††Also extra—Chesebrough 50c. Indiana P. L. 5c.

General Asphalt Has Loss

PHILADELPHIA, May 5.—General Asphalt reports net loss of $651,937 in the 12 months ended March 31, 1933, compared with net loss of $7174 in the preceding 12 months. Gross sales in the period ended this year were $6,360,295, compared with $8,885,629 in the earlier period.

Houston Reports Loss

NEW YORK, May 11.—Houston Oil Co. and Houston Pipe Line Co. report consolidated net loss of $355,294 after all expenses, taxes, interest and reserves, for the first quarter of 1933, compared with net profit of $20,146 for the first quarter of 1932.

Oil and Royalty Stocks on New York Curb

1932 High	1932 Low	1933 High	1933 Low	Par Value	Company	Transactions Week Ended May 13 Sales Shares	High	Low	Last	Week's Change
¾	¼	⅜	⅛	N.P.	American Maracaibo	2,200	⅜	⅛	⅜	0
3¾	¾	2	1⅛	N.P.	Arkansas Nat. Gas	500	1⅝	1⅛	1⅝	+ ⅛
3⅜	½	2	1	N.P.	do A	7,000	1⅜	1¼	1⅜	— ⅛
5⅜	1½	3¼	2	$10	do pfd	200	2⅝	2½	2⅝	+ ⅛
¼	⅛	..	..	N.P.	Atlantic Lobos	.....	.....	.....	.....	.....
⅞	½	2	¾	$50	do pfd	100	1¾	1¾	1¾	— ¼
9¾	6¾	9½	6⅛	N.P.	British Amer. Oil coup.	400	*9½	9⅜	9½	+ ½
¾	¼	1	¼	$¼	Carib Syndicate	1,200	¾	⅝	¾	+ ⅛
6⅞	1¼	3½	2	N.P.	Cities Service	68,300	2⅞	2½	2¾	— ⅛
53⅜	10	17½	10½	$100	do pfd	2,700	14⅜	12⅝	14	0
4½	1	2¼	1	10	do pref. B	500	*2¼	1½	2¼	+ 1¼
45	9	13	5	100	do pref. BB	50	12	12	12	— ¼
1¼	¼	⅞	¼	N.P.	Colon Oil Corp.	2,800	¾	½	½	0
2⅜	½	1¼	⅝	N.P.	Columbia Oil & Gas vtc.	400	1⅜	1	1⅜	+ ⅛
..	..	1½	1	$1	Consolidated Royalty	.....	.....	.....	.....	.....
2⅞	¼	4¼	1⅛	N.P.	Cosden Oil	900	*4¼	2⅞	3½	+ ¼
8	1⅞	8½	3	$100	do pfd	100	*8½	8½	8½	+ 2
⅝	⅛	¾	⅜	N.P.	Crown Central Pet.	1,200	⅝	½	⅝	0
7⅛	1⅝	3½	2⅛	N.P.	Darby Petroleum	100	3⅜	3	3⅜	+ ⅜
3	1	2	⅞	N.P.	Derby Oil & Refg.	400	1⅞	1⅝	1⅞	+ ⅛
24½	10½	25¼	25	N.P.	do pfd	.....	.....	.....	.....	.....
44¾	23	44⅞	24	$25	Gulf Oil Corp.	22,900	*44⅞	39⅝	42½	+ 1⅜
5	¾	2	1¼	N.P.	Indian Ter. Illg. Oil A	100	*2	2	2	+ ¾
4½	1½	1½	1¼	N.P.	do B	.....	....	....	....	....
¾	⅛	..	..	$5	Intercontinental Pet.	.....	.....	.....	.....	.....
1	⅜	1	⅜	N.P.	Kirby Petroleum	500	⅝	⅝	⅝	— ¼
¾	⅛	¾	⅛	$25	Leonard Oil Dev.	3,000	*¾	½	½	— ⅛
3½	⅞	3¼	1¼	N.P.	Lion Oil Refg.	.....	....	....	....	....
11	3⅜	7⅞	4¾	N.P.	Lone Star Gas	6,100	7¾	7¼	7½	+ ⅜
¼	⅛	..	..	$1	Magdalena Syndicate	.....	....	....	....	....
8	3¾	6½	4	N.P.	Margay Oil Co.	.....	.....	.....	.....	.....
3⅜	1½	5	2	N.P.	Mexico-Ohio Oil	200	5	4½	4⅝	+ 1⅜
2	½	3⅝	1	N.P.	Michigan Gas & Oil	6,500	*3⅝	3	3	— ¼
1½	½	1⅛	⅝	N.P.	Mid. States Pet. A vtc.	400	1	1	1	0
⅝	¼	⅝	¼	N.P.	do B vtc.	600	*⅝	½	⅝	+ ⅛
⅜	¼	⅜	¼	$1	Mountain & Gulf	100	⅜	⅜	⅜	0
4¾	2⅛	4⅜	2½	10	Mountain Producers	2,400	4	3¾	4	+ ¼
14⅝	8	14½	10	N.P.	National Fuel Gas	3,000	*14½	12⅝	13¾	+ ⅝
⅞	⅜	1⅜	½	$5	New Bradford Oil	100	1¼	1¼	1¼	0
1½	⅝	1⅛	½	N.P.	North Central Texas	.....	....	....	....	....
⅜	⅛	⅜	⅛	N.P.	North European	800	¼	¼	¼	0
5	2	5¼	3	N.P.	Oil Stocks Ltd. A	100	*5¼	5¼	5¼	+ ⅛
8	3	5⅞	3	N.P.	Pacific Western	400	*5⅞	4⅝	5⅞	+ 2⅝
⅝	⅛	⅝	⅛	N.P.	Pantepec of Venezuela	700	½	⅜	½	0
⅝	⅛	..	..	N.P.	Producers Royalty	.....	....	....	....	....
60¾	40	40½	21	$100	Pure Oil 8% pfd	70	30⅛	29¾	29¾	0
1	½	⅞	¾	N.P.	Red Bank Oil	.....	....	....	....	....
½	⅛	¼	¼	N.P.	Reiter-Foster Oil	100	¼	¼	¼	0
1	⅛	¾	¼	$25	Richfield Oil pfd	100	*¾	¾	¾	+ ½
1½	½	4½	3	N.P.	Root Refining pfd	100	*4½	4¼	4½	+ ⅜
½	½	..	..	$10	Royalty Corp. pfd	.....	....	....	....	....
2⅜	⅝	1½	⅝	N.P.	Ryan Consolidated	.....	....	....	....	....
⅞	⅛	½	⅜	$10	Salt Creek Consol.	.....	....	....	....	....
5½	2⅞	4⅞	3½	10	Salt Creek Prod.	2,500	4⅞	4⅜	4⅞	0
..	..	3¾	⅝	25	Shrev. El Dorado P.L.	300	*3¾	3	3¾	+ ¾
5	2⅞	5	3¼	N.P.	Southland Royalty	3,400	*5	4⅝	4½	0
⅝	¼	¾	¼	$5	Sunray Oil	4,300	*¾	½	¾	+ ¼
10½	4½	8⅜	6¼	N.P.	Texon Oil & Land	400	8⅜	8	8¼	+ ⅛
⅛	⅛	⅛	⅛	$5	Venezuela Petroleum	1,000	1/16	1/16	½	0
2⅜	1⅛	3	1½	1	Woodley Petroleum	200	1⅝	1⅝	1⅝	0
1⅜	½	¾	½	N.P.	Y Oil & Gas	.....	....	....	....	....

*New high. †New low.

Oil Dividends

Declared Last Week

Company and Period	Amount	Stock of Payable	Record
Atlantic Refining Co. q.	25c	June 15	May 22
Northern Pipe Line s.a.	25c	July 1	June 9

Awaiting Payment

May 13, 1933

Company and Period	Amount	Stock of Payable	Record
Buckeye Pipe Line q.	75c	June 15	May 31
Consolidated Oil pfd. q.	$2	May 15	May 1
Indiana Pipe Line s.a.	15c	May 15	Apr. 28
McColl Frontenac q.	15c	June 1	May 15
S. O. California q.	25c	June 15	May 15
S. O. Indiana q.	25c	June 15	May 15
S. O. Nebraska q.	25c	June 20	May 27
S. O. New Jersey s.a.	50c	June 15	May 16
Sun Oil q.	25c	June 15	May 25
do pfd. q.	$1.50	June 1	May 10
Tide Water Oil pfd. q.	$1.25	May 15	Apr. 20
Union Tank Car q.	30c	June 1	May 15

Paid Last Week

Company and Period	Amount	Date Paid
Union Oil q.	25c	May 10

New York Curb Bonds

Week Ending May 13

	High	Low	Last	Change
Cities Serv. 5s '50	34½	31⅝	34¼	+1¼
Cities Serv. 5s '66	34	30½	32⅝	+ ¾
Cities Serv. G. 5½s '42	53	48¼	53	+3½
Cities Serv. G. P. 6s '43	63	61	62½	—1
Cont. Oil 5¼s '37	98¼	98⅝	98	+1
Gulf Oil 5s '37	100	95¾	90	+2½
Gulf Oil 5s '47	95½	92	95½	+2
Indep. Oil 6s '39	92	91	92	+ ¾
Sun Oil 5½s '39	102½	100¼	101¾	+1¼
Tide Water 5s '79	54½	50½	53½	+1

Pittsburgh Stock Exchange

Transactions Week Ended May 12, 1933

	Sales	High	Low	Last	Change Over Week
Ark. Nat. Gas	150	1½	1½	1½	— ¼
do pfd	110	2½	2½	2½	0
†Col. Gas & Elec.	2,015	18	15⅝	17¾	+ ¾
Devonian Oil	100	8	8	8	0
†Lone Star Gas	12,501	8	7⅛	7⅝	+ ½
‡ do 6 p. c. conv. pfd	113	72	70	71	+1
Plymouth Oil	100	9	9	9	+ ¼
‡Stand. Oil of N. J.	136	35	34⅜	34½	— ½
West. Pub. Serv.	1,315	6½	6¼	6¼	+ ¼

†Payable in new preferred stock. ‡Unlisted.

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THE PARABLE OF THE TWO FRUIT PEDDLERS

THE story goes that a certain son of Italy operated a fruit stand on a busy corner of a large Eastern city. Through hard work and initiative he built up a thriving business.

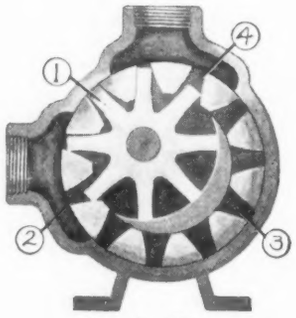
Another son of Italy, noting the success of the particularly ambitious huckster, decided that the opposite street corner should provide a fertile market for another fruit peddler. Accordingly, he set himself up in business.

The first Italian continued to cry his wares with all the enthusiasm and appeal that had resulted in his success. After each loud and clear sales talk on the sweetness of his fruit . . the competitor on the opposite corner would merely cry . . "Me Too."

The Viking Pump Company has spent nearly a quarter of a century and many thousands of dollars pioneering, developing, advertising and selling the Viking "Two Moving Parts" Principle. The business has been successful . . but that is not the moral we are attempting to point out.

After the principle has proved itself so unquestionably sound . . after the pump has established itself as the outstanding leader in its field . . there are those who now cry lustily . . "Me Too."

When considering the purchase of pumps it will be well to remember that the Original and Genuine Viking Rotary Pump is still to be preferred to the "Me Too" variety. For while others may copy our principle it is a question as to whether or not they have been so successful in their manufacturing methods and their research facilities. Viking still offers the most in efficiency, trouble-free service and long life at the least in price.



Study The Viking Patented Principle

1—Rotor and idler mesh, forming barrier between ports. 2—Idler drawing away, creating suction and opening to be filled with liquid. 3—Spaces between rotor and idler teeth completely filled. 4—Idler and rotor teeth mesh again, forcing liquid out.

Before you invest in pumping equipment it will pay you to investigate Viking . . the original and Genuine.

VIKING PUMP COMPANY

CEDAR FALLS, IOWA

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